May 3, 1956

# The IRON AGE

The National Metalworking Weekly

**VACATIONS: Shut Down or Operate?** P.51

Throwaway Ceramics Turn Tough Alloys P.91

New Colors Create Finishing Problems P.54

Digest of the Week P–2

# read how you can save up to $290 a day in cupola coke consumption

Here are other helpful Whiting bulletins that can help answer your Hot Blast questions



"How To Make Your Cupola Operation More Efficient"—FO-1



"Hot Blast For Better Melt, Closer Control, Greater Economy"—FO-3



"Review Of Foundry-Cupola Gas and Temperatures"—FO-9



"Suggestions For Solving Some Cupola Operation Problems"—Bulletin FO-8

Based on an average 400-ton per day cupola melt, pre-heated blast can raise metal temperatures and at the same time create a 28% coke savings! This is possible at an expenditure of only $45 in gas fuel, giving an actual fuel savings of $290 per average work day and many thousands of dollars per production year.

Now any cupola can be converted at low cost with a Whiting-Thermo Hot Blast Heater to provide the highest efficiency in hot blast. Whiting has prepared a new booklet on this cost cutting hot blast heater which tells about all hot blast advantages. It also fully describes burners, combustion chambers, heat exchangers, air booster fans, control panel and controls, auxiliaries, and air by-pass as well as general design features. Write for this free booklet today! Ask for Bulletin FY-174. Ask for the other bulletins shown also!

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DIGEST OF THE WEEK IN METALWORKING

May 3, 1956—Vol. 177, No. 18

The IRON AGE

# Digest of the Week in Metalworking

Starred items are digested at right.

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## NEWS DEVELOPMENTS

**IT'S NOT UNANIMOUS IN STEEL INDUSTRY** P. 53

Some producers are irked over U.S. Steel's decision not to raise prices before labor negotiations. Opinions differ on inventory building. But all agree on good sales and profits for year based on record first quarter. Mr. Weir takes off on pricing.

**MORE COLOR, NEW HEADACHES FOR FINISHERS** P. 54

More consumers want appliances and household goods in color, the right color. Trend is so far advanced that GE, for instance, turns out 18 pct of its appliances in color. Increased demand is making life more difficult for finishers and fabricators.

**WHY TOOL AND DIE MAKERS ARE HAPPY** P. 59

It looks like a record year in tool and die making. Auto tooling programs are big. Appliance makers show trend to more frequent re-tooling. But some small shops find going tough and profits slim. Defense is only small part of total.

**MACHINERY PRICES CLIMB LESS THAN WAGES** P. 60

MAPI survey shows that wages have gained substantially more than prices of machine tools. This price advantage is cited as a big factor in the heavy expenditures for capital goods and new machinery.

**WEST NEEDS LOTS MORE STEEL PRODUCTION** P. 77

Although western mills are going full blast, consumers must go to eastern mills for 40 pct of their needs. Consumers will use 6.5 million tons this year, while area's mills will turn out less than 4 million tons. A few expansion plans are in the works.

PERENNIAL PROBLEM of whether to operate or shut down during vacations faces industry once again. Iron Age survey reflects industry thinking on problem. Story P. 51.

**METALWORKING DIGEST: A NEW IRON AGE FEATURE** P. 176

News breaks are no respecters of deadlines. To keep you abreast of late-breaking developments in news, markets and prices, Iron Age begins a new digest page this week. For convenience, you'll find it always in the same spot—"back of the book," next to the last page. Try it for size.

## FEATURE ARTICLES

**THROWAWAY CERAMIC TURNS NEW LATHE PROFITS** P. 91

You don't have to wait for super-rigid ultra-powered machine tools. You can use one of the newest types of ceramic tools right now on conventional lathes. It'll cut anything but a diamond, comes in round, square, triangular throwaway blanks. It's supplied in a single grade, and can switch over from rough to finishing cuts easily.

**ANODIZED ALUMINUM HAS 'POT O' GOLD' FUTURE** P. 95

Prospects look good for anodized aluminum. Autos, trains, buses, appliances, housewares, buildings are finding new customer appeal in bright colored components. But color isn't the whole story. New anodizing techniques are creating finishes more resistant to heat, erosion, corrosion. Witness growing use of anodized parts in critical applications where color doesn't count.

**SMALL SHOP FIGHTS BACK WITH CASTING QUALITY** P. 98

Small job shops have certain advantages over their bigger neighbors, like customer convenience, lower overhead. Despite this, a number have lost business in recent years. Now statistical quality control, plus a tailored cost accounting system, is helping some bounce back. The teamed techniques pinpoint areas of weakness.

**ARE POOR BENDS DRAINING YOUR STAMPING PROFITS?** P. 100

Just simple bends in simple stampings. Where can you go wrong? But when one piles on another, get ready for headaches. On the other hand, bend your blanks properly, and you'll save time, reduce scrap, make a better product. Here are some of the hidden problems—and paths around them.

**WELDING JOB MADE EASIER WITH DUAL-GAS SETUP** P. 104

Most often it pays to ride along with the same welding setup in making welds on the same assembly, on shielding gas as well as equipment. Parish Pressed Steel Div. justifiably takes the exceptional approach. It finds a dual shielding gas setup for the same assembly an asset. Welding practice bombs, it uses argon for one weld, $CO_2$ for another.

## MARKETS AND PRICES

**SHORTAGE OF OIL DRILLING PRODUCTS GROWS** P. 56

Buyers of oil country goods learn that third quarter allotments are to be cut. Drillers, trying for record year, are hard pressed for tubing and casing. Reserves are just about used up, despite mills' best efforts.

**PIPE DISTRIBUTORS GO TO SALES SCHOOL** P. 57

Republic Steel receives big response from pipe education plan. Theory is that few distributors have even seen a steel mill. School covers quality, applications, structure and many of the fine points of pipe use and merchandising.

**MORE SIMPLICITY IN MACHINE TOOL DESIGN** P. 79

Industrial designer Raymond F. Loewy predicts trend to simplicity in form, operation and maintenance. Mr. Loewy spoke at Panorama of Progress at University of Cincinnati. Progress in electronic techniques among subjects stressed at event.

**EXPORT MARKET STEEL'S ACE IN HOLE** P. 147

If worst comes to worst, steel producers can fall back on a strong export market to take up any domestic slack. But the tip-off on the domestic outlook is that mills are avoiding heavy export commitments.

**ANACONDA PROMOTES ONE WORLD PRICE** P. 154

New Anaconda policy keeps Chilean copper sold in U. S. from dropping below 46¢. Oversupply in LME helps bring about one world price. May not hold, but future looks bright for copper fabricators.

## NEXT WEEK:

**WHAT'S BEHIND U. S. STEEL'S LABOR POLICY**

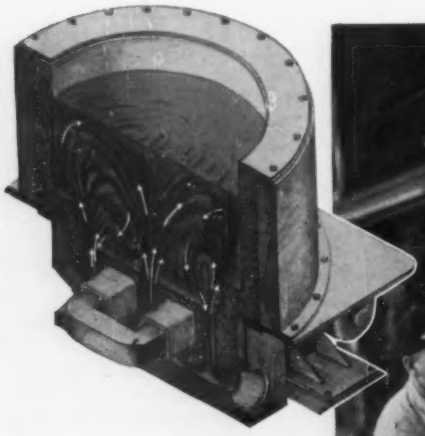
Unseen bargainers are factors in U. S. Steel decisions in its dealings with steel labor. Tom Campbell looks behind the scenes as he develops the whys and wherefores of the company's labor policy.

# Hard-To-Melt Bronzes Successfully Handled

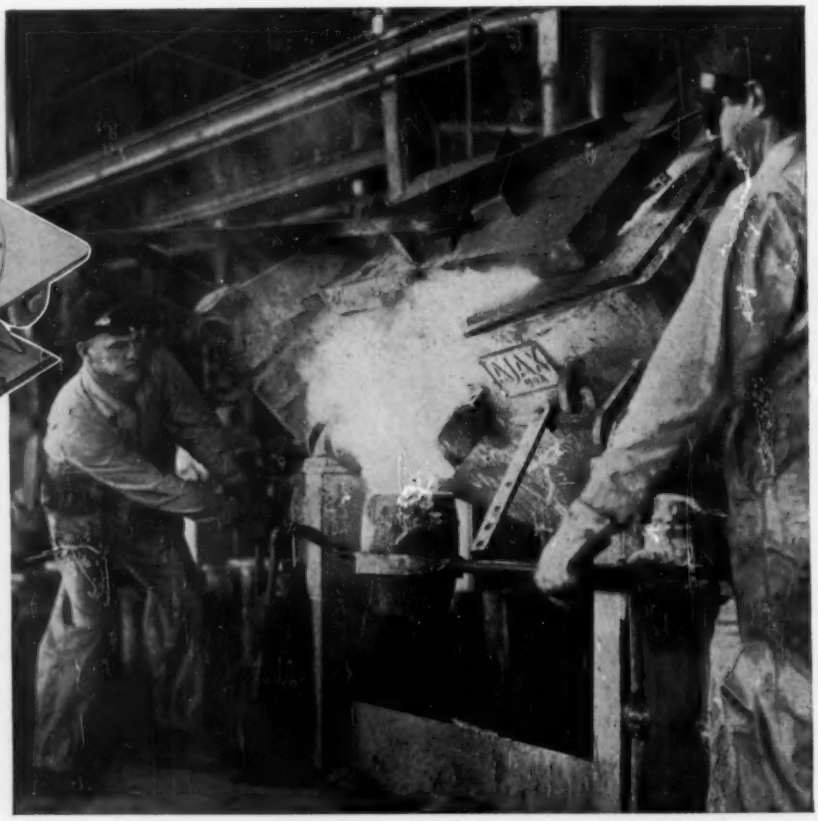
## In

## Ajax Induction Furnaces

Brass and bronze foundries all over the country have found AJAX-TAMA-WYATT induction furnaces a reliable tool for melting silicon bronzes, aluminum bronzes, leaded bronzes, phosphor bronzes, and other high strength alloys. Operation is highly economical due to the good uniformity of the alloys, low ratio of rejects, drastic reduction of metal losses, and clean operating conditions. This recent development opens the field for the use of AJAX induction furnaces in all foundries where difficult-to-melt alloys are handled.



*Cross section of AJAX-TAMA-WYATT twin coil induction furnace such as used at the Torrance Brass Foundry. Heat is produced within the molten metal in the secondary channels and conveyed throughout the melt by electromagnetic circulation, resulting in minimum metal losses and high uniformity of alloy. Temperature is automatically controlled.*



**Baseball Fans—Do you recognize this man? He is Rocky Bridges, Cincinnati Redleg infielder, keeping in condition during the winter season at Torrance Brass Foundry, Torrance, Cal.**

**(Photograph courtesy of Long Beach Press-Telegram, Long Beach, Cal.)**

The furnace pictured here is melting aluminum bronze at the *Torrance Brass Foundry, Torrance, Cal.*, operating at a temperature of 2400 F, for the production of high strength centrifugal castings. This unit is rated 100 kw. Note also the clean, smokeless operation as shown in the unretouched photograph.

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We think it might be an item of interest to all our customers to know that Ohio Ferro-Alloys Corporation was conceived almost a third of a century ago in the minds of men who were busy making Canton, Ohio the world's largest producer of fine alloy steels.

Out of their success came the capital which launched our corporation. But more important than all came the precious "on the scene, day by day experience" which now enables us to chart our course with confidence.

Here in the heart of alloy steel making America we quickly feel the changing pulse of the industry, feel the first impact of new developments

We gladly share with you, all our ferro-alloy customers, the advantages we enjoy in living next door to the world's greatest alloy steel laboratory . . . the laboratory of practical experience.

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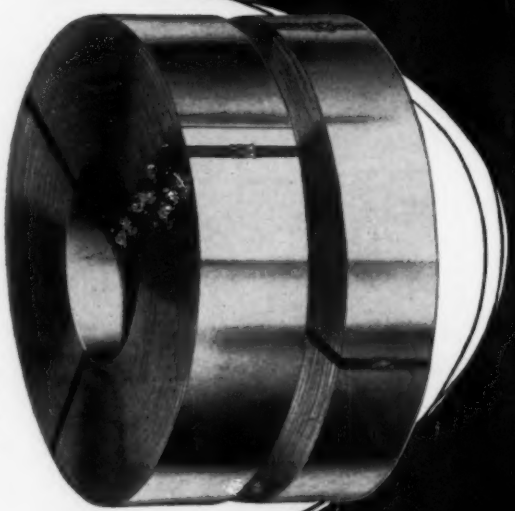

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Indexed in the Industrial Arts Index and the Engineering Index.

EPA NBP

# EDITORIAL

## Well Now That's More Like It!

◆ THIS WEEK Mr. Crawford H. Greenewalt, DuPont president, will be happy. In a talk to the American Newspaper Publishers' Assn. last week, he was properly worried about our trend towards over-subordinating man to the group or to the company. Too much chance there, he said, for us to lose the imagination of the individual.

In case you haven't followed it, there is a lively personal exchange of ideas going on in the steel industry. We had almost reached the belief that this lusty industry was going the way of all flesh; as indicated by Mr. Greenewalt. But it isn't.

Recently, Mr. Ernest T. Weir, National Steel's scrappy board chairman, wondered out loud why U. S. Steel hadn't raised the price of steel to pay for much needed capacity expansion.

A short time later, Mr. Avery C. Adams, peppy Pittsburgh Steel president, argued that there ought to be a price increase "yesterday." Later Adm. Ben Moreell, Jones & Laughlin Steel board chairman, said amen.

So far that looks like a good old fashioned revival of names make the news—personal names, that is. Then Mr. Roger M. Blough, U. S. Steel's new board chairman, happened to say last week that there would be no price increase by his company at this time. Next day Mr. Weir said that statement made him "very unhappy."

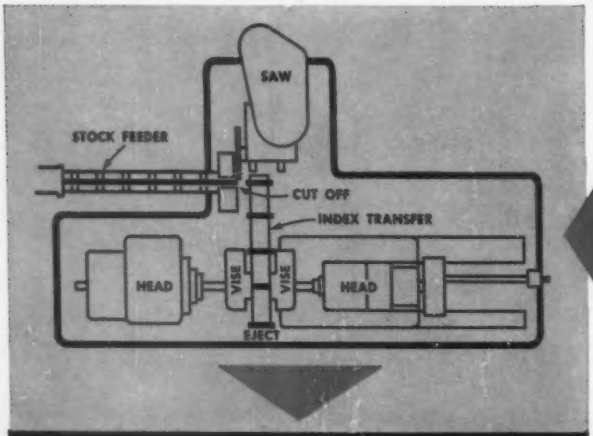
Things had about simmered down when last Thursday a reporter recalled to Mr. Eugene G. Grace, chairman of Bethlehem Steel, that Mr. Blough had said there was substantial steel inventory building. Not so in his company, argued Mr. Grace. He said flatly that Bethlehem's customers were not building inventory. On steel prices Mr. Grace was in no big hurry.

Some will say that these industry leaders ought to keep their ideas to themselves — at least in an election year. But those who say that have forgotten that the steel industry was never one to breed diplomats and striped pants personalities.

Maybe it is just as well that it is that way. This would be a poor country and steel would be a poor industry if we all acted by rote. Aside from that, what about this talk about higher prices for expansion? It may be getting a better hearing via these sharp personal comments than it would get by formal statements.

Tom Campbell

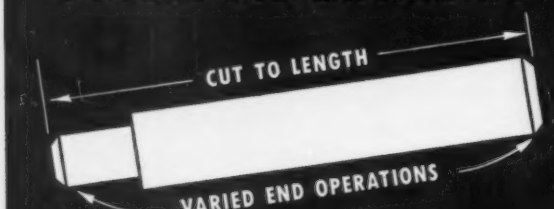
EDITOR-IN-CHIEF




# HOT BED OF ACTIVITY

Motch & Merryweather's new transfer machine widens the horizon for the simultaneous double-end machining of bar stock or tubing. Combined with cut-off to accurate length are: centering, chamfering, turning, drilling, or boring. Box mill turning is performed along with center drilling and chamfering. From stock pile to discharge, all operations can be fully automated. For the quickest answer to speed your stock processing, send us your part drawing.

*Simultaneous*
**STOCK CUT OFF and DOUBLE END MACHINING**




**THE MOTCH & MERRYWEATHER MACHINERY CO.**

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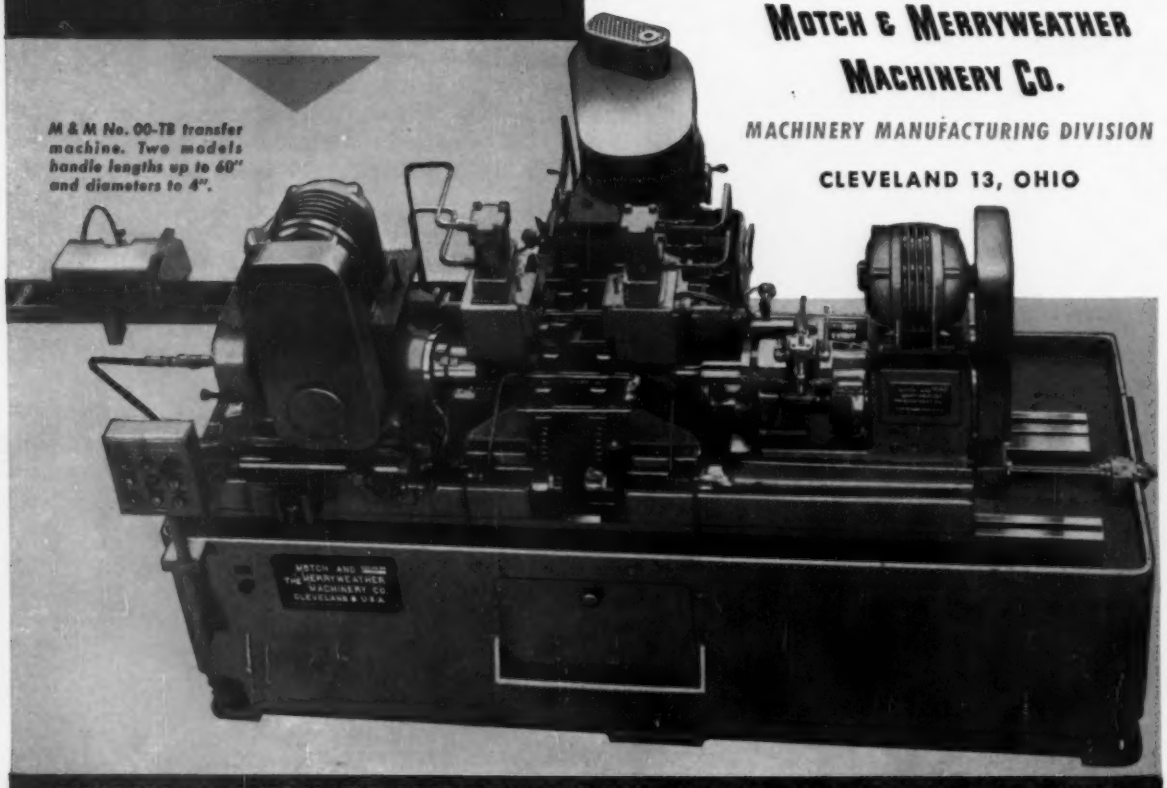

*M & M No. 00-TB transfer machine. Two models handle lengths up to 60" and diameters to 4".*

*BUILDERS OF AUTOMATIC PRECISION CUT-OFF, MILLING, AND SPECIAL MACHINERY*

## dear editor: *letters from readers*

### Salesmen and People

Sir:

I was impressed by the editorial "Salesmen Are People Too!" in the April 19 issue, particularly the reference to "belonging."

The art of encouraging people to feel they "belong" should be emphasized more often, and exercised with sincerity.

Congratulations on sounding a most important and true note. *F. H. Smith, President, Smith Tube Corp., Ridgewood, N. J.*

### Alcoholism and Industry

Sir:

Will you kindly send us 1000 reprints of Mr. G. Grant Carr's article "Alcoholism: You Can Ease Its Headache," page 62 of the April 19, 1956, issue of THE IRON AGE.

We would like very much to distribute this article among the industrial companies in this area. *E. D. Whitney, Executive Director, Boston Committee on Alcoholism, Inc., Boston, Mass.*

### Need Credit Unions?

Sir:

I was much interested in Mr. Hiatt's statement in the April 5 letters, "Perhaps our most urgent need for sound economy is to make money credit easier for the working man. He is the man that needs it most, and yet he is paying the highest interest rates; akin to usury in my book."

He has put his finger on a problem which almost 10 million people are trying to solve by means of credit unions. We who are in the movement believe we have an excellent solution.

Additional information is available, without cost or obligation, from the Credit Union National Association, Madison, Wisconsin. *E. P. Porter, Personnel Manager, Cameron Mfg. Corp., Emporium, Pa.*

### Taconite Report

Sir:

I have read with great interest Mr. Rohan's article in your issue of April 12 on Taconite. Will you please send me several copies for distribution within our organization. *P. G. Shoan, President, Shook & Fletcher Supply Co., Birmingham, Ala.*

Sampling Taconite Pellets

Sir:

Kindly send three reprints on the article "Taconite Gives New Life to Mesabi," a special report which was printed in the April 12 issue of THE IRON AGE. C. Dorau, *General Foreman, Fabrication Shop, Nordberg Mfg. Co., Milwaukee, Wis.*

Sir:

Please send us three reprints of the article entitled, "Taconite Gives New Life to Mesabi." *F. D. DeVaney, Chief Metallurgist, Pickands, Mather & Co., Mining Dept., Hibbing, Minn.*


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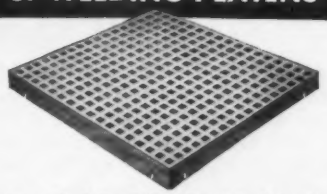
BENDING BLOCKS or WELDING PLATENS



4 ft x 4 ft—5 ft x 5 ft—5 ft x 6 ft. Also other sizes. Cast steel blocks for layout, welding & assembly. Tools, stands & accessories. Write today for information.

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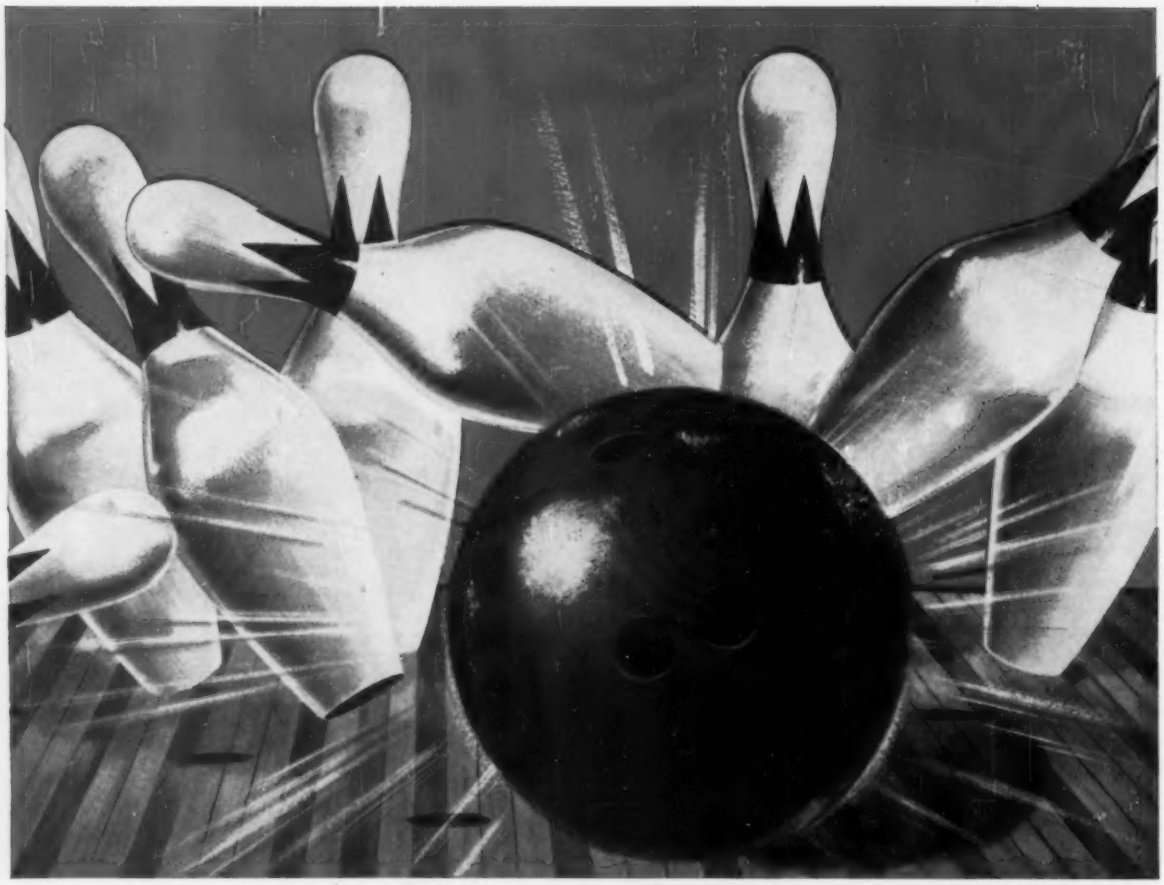
Like to speed up your reading?
Turn to pages 2 and 3 of The Iron Age every week and let the
Digest of the Week in Metalworking
help you find your favorite features.
IT PAYS TO READ IRON AGE ADS TOO!



# "Finish first in your league"
# ...with J&L 1200 COLD FINISHED STEELS

When your machining applications require a steel that's tops in quality, machinability, uniformity and surface finish—"J&L 1200" Cold Finished Steel is the answer. It's one of a complete line of premium quality, free-machining bar steels developed over the years by J&L specialists. Thus, we can recommend the right type to help solve your problems.

Operators in shop after shop around the country using "J&L 1200" report:

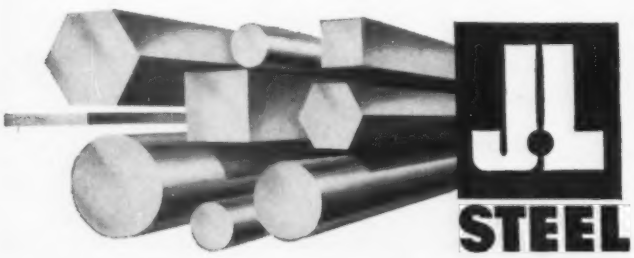
- Better machine finishes
- Improved tool life
- Increased machining speeds
- Greater uniformity

"J&L 1200" grades, available in all standard shapes and sizes, meet the compositions published by the American Iron & Steel Institute (AISI C-1213) . . . Society of Automotive Engineers (SAE 1113) . . . and Federal Specification QQS-633.

Use this steel in your own shop to secure better work at lower over-all costs. Results will convince you "J&L 1200" deserves to be a regular specification for your production runs.

Adequate stocks of all J&L cold finished free-machining steels are available in important industrial centers. Phone the nearest J&L District Office or your Distributor today for prompt and efficient service.

*Pick the Free-Machining Steel that serves you best—from J&L's complete Cold Finished Line*




**Jones & Laughlin**
STEEL CORPORATION · PITTSBURGH

COLD FINISHING PLANTS AT
PITTSBURGH, PA., AND HAMMOND, IND.

## fatigue cracks

*by William M. Coffey*

### New Feature

"Metalworking Briefs," a brand new feature, starts this week on p. 176. That's facing the next to the last page and that's where you can plan on finding it every week from now on. Turn now—see if you like it—then come back and finish reading the priceless prose that follows here.

### Dear Editor

No, you are not seeing double. Just thought we'd give you a little of the story behind the column that appears just ahead of this one. Why don't we have more controversial letters? Why do we occasionally use initials instead of the full name? How many letters do we have to choose from for that section?

First, on controversial letters. Nothing we like better than a good clean fight. But we don't have a great many, and readers sometimes wonder why. The reason is that unlike a consumer magazine our readers would be writing on business subjects, things that might concern their relationships with suppliers, customers, labor, government, etc. By the time an IRON AGE reader contemplates all the potential ramifications he often decides that he'd better not go on record. As one of them put it, "Suppose I burn up just one good customer?" That explains why many a would-be controversy dies aborning.

There are ways around this. You can ask that we not use your name. We won't publish letters that come to us anonymously but we *will* use initials where someone has a beef he wants to get off his chest without risk of riling customers, stockholders, management, labor, employees, etc.

### A Heap of Mail

Why don't we have a bigger column, more letters? Well, aside from the fact that businessmen are less likely to stir up controversy than individuals, you have the difference in circulation between the business paper and the consumer magazine. We've received as many as 500 letters on a single article. (We published only a few.) But 500 is a lot of letters if you look at it this way. The consumer magazine with a circulation of 4,500,000 would have to receive 50,000 letters to have the same ratio as THE IRON AGE'S 500, with its circulation of some 45,000.

### Some Reaction

Another thing, human nature being what it is. If you step on someone's toes you'll get an instantaneous scream. Otherwise, silence. Example: Recently we carried an article which the editors thought would have quite an impact, yet we received only a score of inquiries for more details. This was disappointing until one of the editors bumped into a man from the company about whom the article was written. The editor politely wondered if the company had had any reaction. "Reaction? Hell, we were so swamped with letters, wires and phone calls that we didn't get any work done in the office for a week!"

### New Puzzler

It looks as though we gave you a tough one April 5. That was the cube problem submitted by foundry engineers Gienanth and Pacyna of Muelheim, Germany. Here's an easier one from the same source. Arrange 12 coins in such a way that seven straight lines will hit them. On each of the seven straight lines there must be four coins. There are at least two solutions.

---

Errata: Notice we omitted the year in last week's time capsule story. Should have pointed out that THE IRON AGE issue was April 9, 1874.

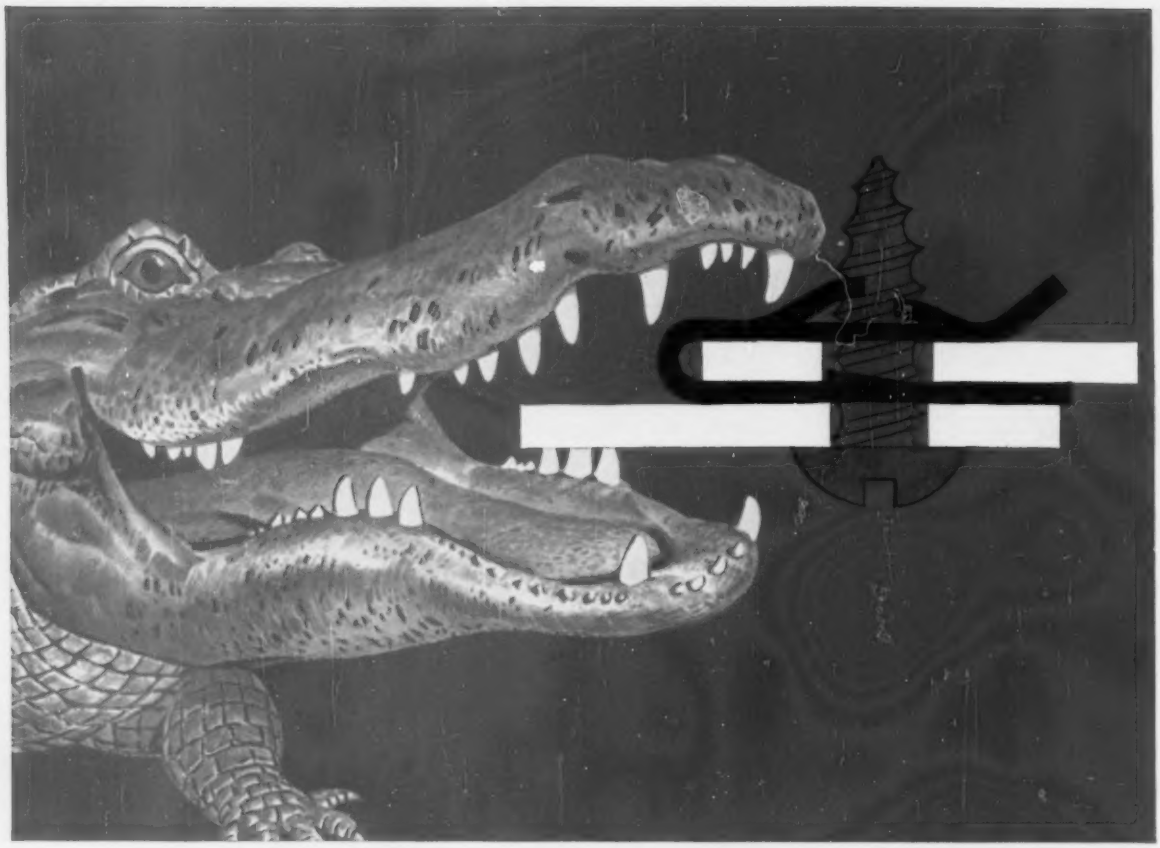
THE ZIPPO FLIP... HINGES ON SEYMOUR

Zippo lighters "flip their lids" on hinges made of SEYMOUR NICKEL SILVER—the metal that combines beauty with durability. Malleable and ductile, this fine metal is found wherever uniform high quality is demanded. Nickel silver users everywhere say . . .

*"Specify Seymour—you KNOW it's good!"*

SEYMOUR

THE SEYMOUR MANUFACTURING CO.
2 Franklin Street, Seymour, Connecticut



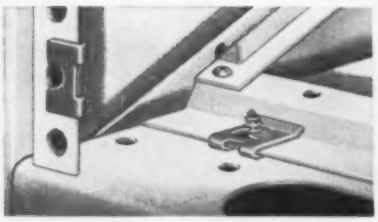
# STEEL JAWS THAT NEVER RELAX
## fasten a fastener in place

Alligator jaws have nothing on Tinnerman "U" and "J" type fasteners in gripping power. These fasteners press easily into locked-on position over panel edge or center panel locations. Yet they provide positive self-retention, ending the need for welding, staking or other secondary fastening devices. They are ideally suited for blind assembly or hard-to-reach locations.

When combined with the familiar Tinnerman SPEED NUT, this unique fastening principle provides a one-piece, self-locking, self-retaining fastener that is fast and easy to apply. The "U" or "J" feature can be combined with wire and tube retainers, latches, catches and a host of other fastening requirements to save time, material and production costs.

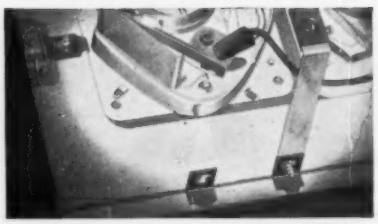
Find out about these and more than 8,000 other types of SPEED NUT brand fasteners now serving industry all around the world. They can make important savings for you, can also simplify your assemblies. See your Tinnerman representative soon or write to us. **Tinnerman Products, Inc., Box 6688, Dept. 12, Cleveland 1, Ohio.**

**TINNERMAN**
*Speed Nuts*®
FASTEST THING IN FASTENINGS®



Greater flexibility for control equipment enclosures is provided by self-retaining "J" type SPEED NUTS at 30% less production cost.

Assembly costs on this sheet-metal skylight frame are reduced 66% by Tinnerman "U" type SPEED NUTS.



Gas range assembly costs are reduced 25% to 50% by using Tinnerman "U" and "J" type SPEED NUTS.

## dates to remember

### MAY

AMERICAN WELDING SOCIETY—National spring meeting, May 7-11, Hotel Statler, Buffalo, N. Y. Society headquarters, 33 W. 39th St., New York.

THE NATIONAL ASSN. OF SHEET METAL DISTRIBUTORS—46th spring meeting, May 14-15, Hotel Roosevelt, Pittsburgh. Assn. headquarters, 1900 Arch St., Philadelphia.

NATIONAL ASSN. OF WASTE MATERIAL DEALERS, INC.—Spring meeting, May 16, The Sheraton-Astor Hotel, N. Y. Society headquarters, 271 Madison Ave., N. Y.

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EXPOSITIONS

AMERICAN FOUNDRYMEN'S SOCIETY —May 3-9, Atlantic City, N. J.

AMERICAN WELDING SOCIETY—May 7-11, Buffalo, N. Y.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

ASSN. OF IRON & STEEL ENGINEERS, Sept. 25-28, Cleveland.

METAL SHOW—Oct. 8-12, Cleveland.

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PORCELAIN ENAMEL INSTITUTE—Midyear divisional conference, May 16-17, Edgewater Beach Hotel, Chicago. Society headquarters, 1346 Connecticut Ave., N.W., Washington 6, D. C.

SOCIETY FOR ADVANCEMENT OF MANAGEMENT — Material handling conference, May 17-18, Hotel Statler, New York City. Society headquarters, 74 Fifth Ave., N. Y.

AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN. — Annual convention, May 20-23, Atlantic City, N. J. Society headquarters, 2130 Keith Bldg., Cleveland.

WIRE REINFORCEMENT INSTITUTE —Annual spring meeting, May 28-30, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, National Press Bldg., Washington 4, D. C.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, May 28-June 2, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 39 S. Dearborn St., Chicago.

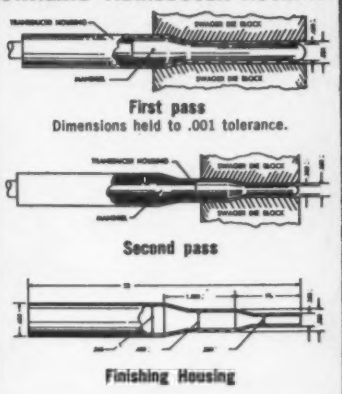
STEEL JOIST INSTITUTE — Annual meeting, May 29-30, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, Dupont Circle Bldg., 1346 Connecticut Ave., Washington, D. C.

### JUNE

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Summer meeting, June 3-8, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters, 29 W. 39th St., N. Y.


ARE YOU MACHINING **when you should be SWAGING?**

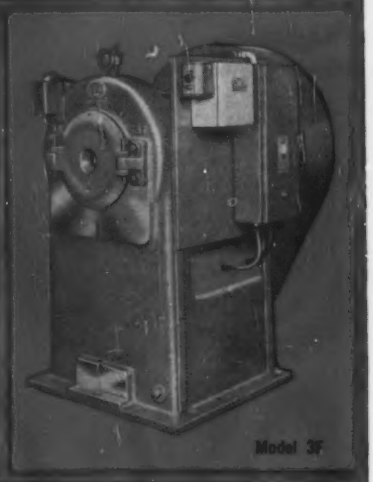
**SWAGING TRANSDUCER HOUSING**



First pass
Dimensions held to .001 tolerance.

Second pass

Finishing Housing

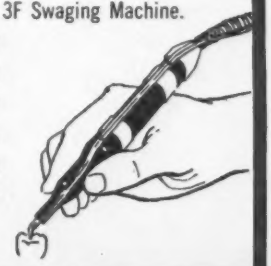


Model 3F

**How SWAGING cuts costs 80% on Transducer Housing**

The Cavitron Ultrasonic Dental Unit provides a marvelous new method for preparing cavities without noise, vibration and heat which contribute so greatly to dental pain and discomfort. Internal dimensions of the transducer housing are critical. A mating cap requires the outside diameter to be rigidly held as well. This housing was formerly machined in two parts and silver brazed together. Now, it is made in one piece from tube stock in 2 passes on a Fenn Model 3F Swaging Machine.

**RESULT** — Cavitron has not only reduced cost of the Transducer Housing 75% to 80% but now has a simplified one-piece housing that is stronger, easier to make and with a smooth, bright surface resulting from swaging which requires no additional finishing. Write for catalog and full information.



FENN

**SWAGING**
may have important advantages and savings in the manufacture of your products. Fenn engineers are at your service.

Precision Rolling Mills

Turks Heads

Wire Shaping Mills

Swaging Machines

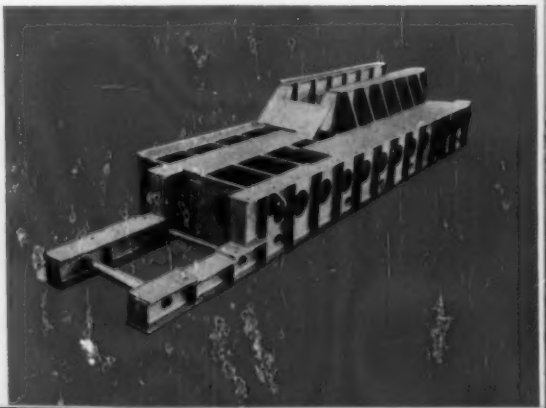
Wire and Tube Drawing Machines

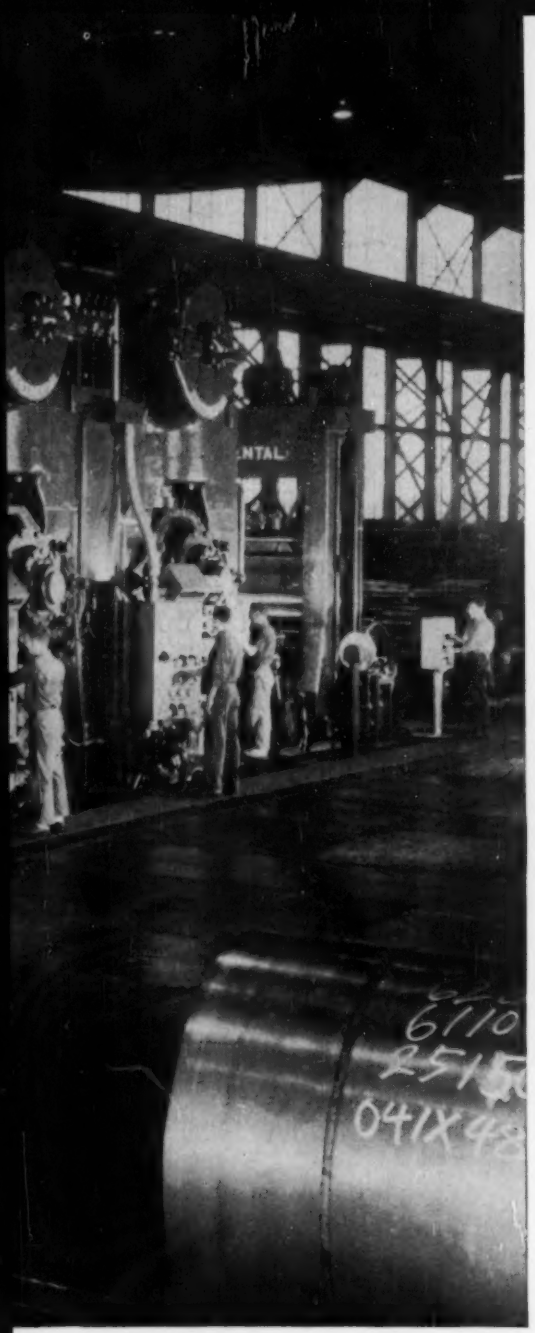
**FENN MANUFACTURING CO., 302 Fenn Road, Newington, Connecticut**

**CONTINENTAL** high-speed 21"x53"x60", 4-stand tandem cold mill in the Gibraltar Plant of the McLouth Steel Corporation.

**CASTINGS**—carbon and alloy steel castings from 20 to 250,000 pounds.

**WELDMENTS**—fabricated steel plate, or cast-weld design.





# BLAW-KNOX

## makes what it takes

## to cold roll

## at high speeds

In the Gibraltar Plant of McLouth Steel, this modern CONTINENTAL 60-inch, 4-stand tandem cold mill rolls steel at delivery speeds in excess of 3,000 fpm.

Designed to meet specific customer requirements, the mill has interesting features, such as—(1) entry and delivery coil conveyors of this cold strip mill, and two single-stand skin-pass mills, are at floor level—which provides greater safety, more efficient handling and easy inspection of all coils during processing. (2) mill equipment has built-in raceways to carry the electrical cables—which simplified the installation and provides easy access for maintenance.

BLAW-KNOX designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

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***Foundry and Mill Machinery Division***
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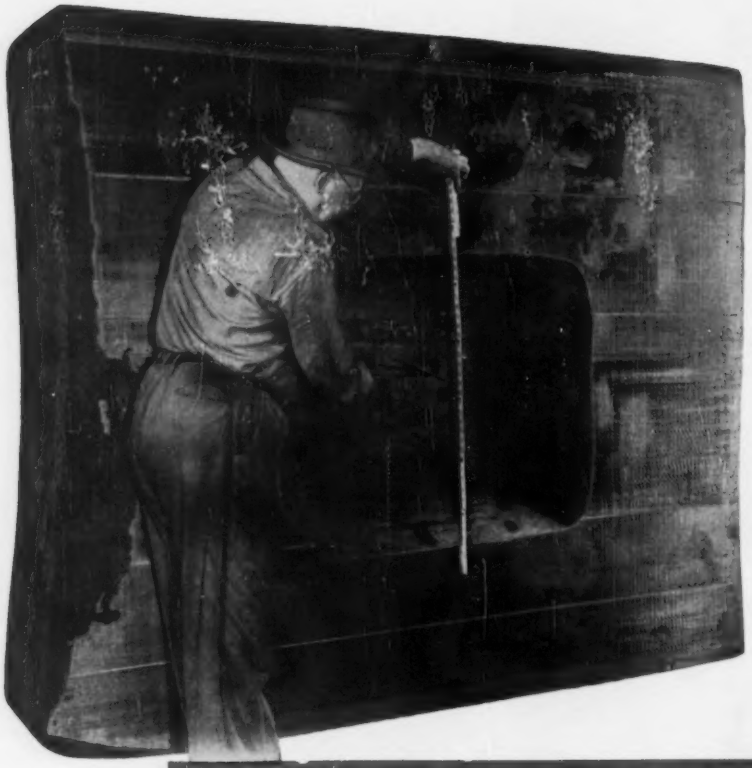
Complete Rolling Mill Installations . . . Including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills . . . roll lathes • chippers • special machinery • and complete auxiliary equipment.

**ROLLS**—Iron, alloy iron and steel rolls for all types of rolling mills.

50th Anniversary
BLAW-KNOX
1906-1956

CONTINENTAL



## Forged-in pockets provide tougher, stronger dies

This 35,000-pound die block, made of Finkl FX-T3 steel, has a forged-in pocket 12″x29″x34″. In addition to the improved physical properties, the pocket forging increases the saving in machining time. There are many ways, such as this, that Finkl engineers can help you when planning die block or forging requirements.

When you next consider hot work tooling, die blocks or forgings, consider Finkl for the best. The quality of Finkl Hot Work Die Steels is the finest available and costs you less in the long run. Finkl die blocks will make a lasting impression with "impressions that last." Our engineers will gladly offer the advantage of their knowledge and our experience. There is no obligation.

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•
HOT WORK STEEL
•
FORGINGS
•
ELECTRIC FURNACE STEELS

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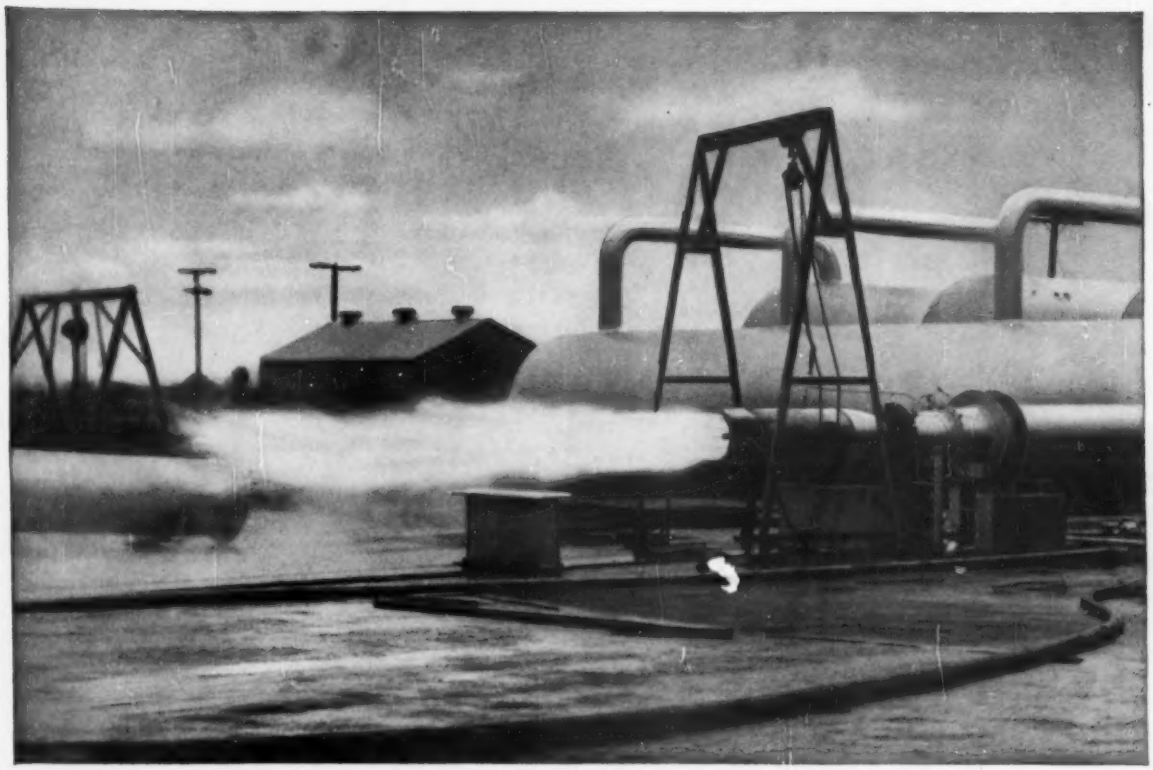
**A. Finkl & Sons Co.**
2011 SOUTHPORT AVENUE • CHICAGO 14



Ramjet tailpipes withstand severe abuse. (*Photo courtesy Marquardt Aircraft Company*)

# MULTIMET Alloy Controls the Blast of Ramjet Engines

Tailpipes used to direct the searing blast of power in today's ramjet engines must withstand temperatures in excess of 2000 deg. F, plus severe vibration. High-speed ramjets operate in the neighborhood of 1500 mph. At these high speeds, vibration is almost as serious a threat to tailpipe life as heat. Because of its strength at high temperatures, MULTIMET alloy has given good service in tailpipes that vibrate as much as three inches.

Ramjet tailpipes are made of MULTIMET alloy sheet that is only 0.051 to 0.078 in. thick. The combined high-temperature strength and oxidation resistance of MULTIMET alloy permits the use of lightweight tailpipes with good heat-transfer properties.

MULTIMET alloy is one of many HAYNES alloys capable of extending the life of parts used at high temperatures. For literature describing the properties of HAYNES high-temperature alloys, get in touch with the nearest Haynes Stellite Company Office.

HAYNES TRADE-MARK ALLOYS

**HAYNES STELLITE COMPANY**

**A Division of Union Carbide and Carbon Corporation**

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*"Haynes" and "Multimet" are registered trade-marks of Union Carbide and Carbon Corporation.*

To get clean wipers at the tool crib, this lathe operator must make the hike, then stand in line. Dirty wipers in hand, he makes the trip at least once a day, takes several minutes to do it.

# He has to waste 60 minutes a week

Easy to distribute

Really soak up oil . . .

Always a clean one handy . . .

Just toss 'em in the trash . . .

With a carton of 125 clean Scott Wipers at every workbench, daily wiper replacement is often unnecessary. One carton can last for days and a man has a fresh supply right at his fingertips.

# . . . He stays on the job

## *The difference is . . . Scott Wipers*

Check your production line. See how much time the men are forced to waste in order to keep supplied with fresh wiping material.

It adds up to more lost production time than you might think.

Scott Wipers are disposable. A man picks up a carton when he checks in . . . keeps it with him all day long. He uses one Wiper thoroughly—throws it away. Complicated distribution is ended. So is sorting, baling, and laundering.

And with fresh Scott Wipers there's no danger of hidden chips damaging men or metal.

Your local Scott representative or distributor will demonstrate the Scott Wiper in your plant. Call him or mail this coupon today.

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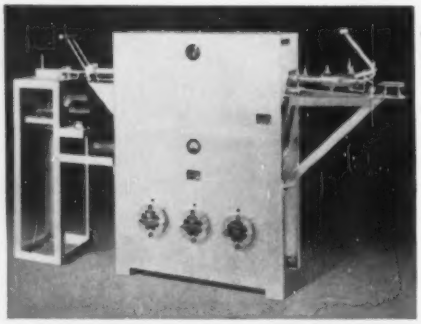
# HARPER

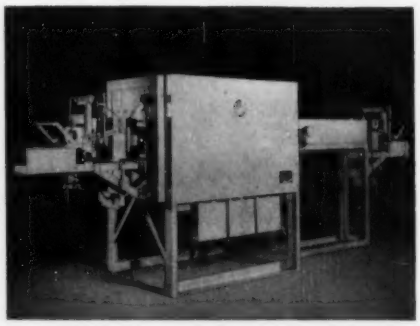
## THE COMPLETE LINE OF SINTERING FURNACES

### Here Are Six Types of Harper Electric Furnaces Being Used for Powdered Metal Work



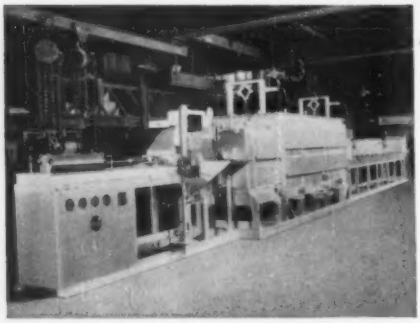
**HIGH TEMPERATURE TUBE FURNACE**

The only sintering research furnace with really uniform heat up to 3000°F., fast heating, suitable for almost any atmosphere, and low in cost. Has been used by many of the foremost powder metallurgy researchers for 15 years.



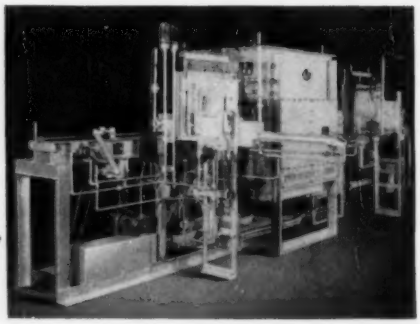
**CONTROLLED ATMOSPHERE BOX FURNACE**

Ideal for research, pilot plant, and small production. Temperatures up to 2500°F. with reducing atmospheres. Used with and without muffle. Suitable for batch or straight-through pusher operation, with water-cooled cooling chamber. Wide range of sizes.



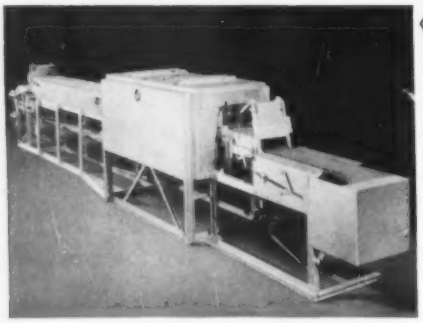
**MECHANICAL OR HYDRAULIC PUSHER FURNACE**

These continuous automatic furnaces are used for sintering of heavy parts on a large-volume basis. Ideal for work requiring long soaking periods at temperatures up to 2300°F. Several zones of temperature control. Available with purge chambers for dry hydrogen service.



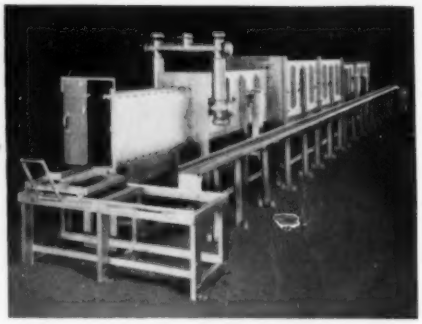
**MOLYBDENUM GRID FURNACE**

Moly furnaces handle the sintering applications up to 3000°F. Presently in use on carbides, tungsten contact points, heavy metals, and metallizing ceramics. Available as batch or continuous pusher furnace.



**CONTINUOUS MESH BELT CONVEYOR FURNACE**

For automatic uniform sintering of small parts at production rates up to 450 pounds per hour. Used with special atmospheres at sintering temperatures up to 2100°F.



**CONTINUOUS TUNNEL KILN**

Both pusher and continuous car tunnel kilns are used at temperatures up to 2750°F. for sintering ferrites, permanent magnets and carbon parts. Designed to maintain extremely close control of firing curves. Equipped for use with or without special atmospheres.

YES, HARPER engineers have been applying heat to the sintering of powdered metal parts for over 15 years, at all stages from research to completely automatic high production.

Mail the coupon for literature and a free copy of Harper's new Powder Metallurgy Bibliography. Or if you have a sintering problem now, why not write us about it?

# HARPER
## ELECTRIC FURNACES

**FOR**

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49 River St., Buffalo 2, N. Y.

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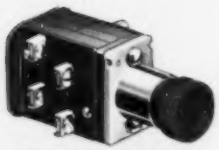
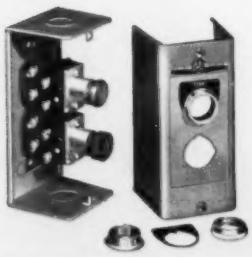
# ALLEN-BRADLEY
# HEAVY DUTY PUSH BUTTONS



Bulletin 800 heavy duty STOP button ready to mount in enclosure. (See below)

These new Bulletin 800 heavy duty push buttons are the modernized version of that old reliable line of A-B heavy duty stations. Advantages—until now restricted to the oiltight stations for machine tool use—have been built into these new heavy duty stations—and you'll like the result.

For instance, each button or pilot light is a self-contained unit which can be mounted singly or in groups—vertically or horizontally—in a variety of standard Allen-Bradley enclosures, with the name plate reading in the right direction. Double break, silver alloy contacts used throughout. Send for Bulletin 800.



A small stock of standard components lets you assemble any special heavy duty station. There is no waiting for special push button stations.

Allen-Bradley Co., 1316 S. Second St.
Milwaukee 4, Wisconsin

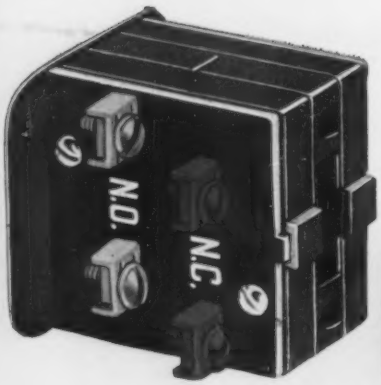
In Canada
Allen-Bradley Canada Ltd., Galt, Ont.

A-B Quality

ALLEN-BRADLEY
QUALITY

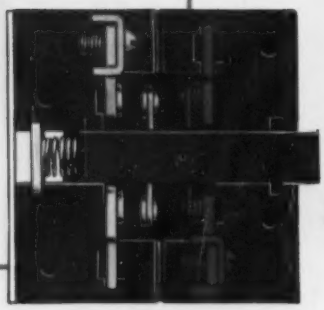
BULLETIN 800 PUSH BUTTONS

5-56-MR



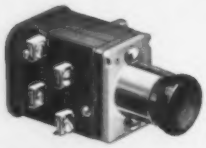

Left—External view of contact block showing N. O. & N. C. terminals.

Right—Internal view of contact block showing double break N.O. & N.C. stationary contacts. The pushrod carries the moving contacts.

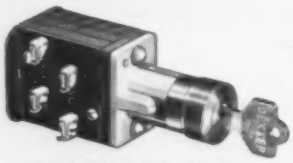


Two button station with name plate and clamping ring removed from cover.

# A NEW LINE OF ALLEN-BRADLEY HEAVY DUTY PUSH BUTTONS

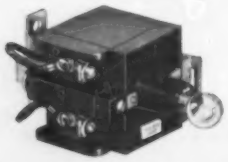


Type AK1B flush head START button



Type EK11B cylinder lock unit

Type HK11B wing lever selector switch unit



Type PK16 pilot light with 110 v, 60 cy. transformer. Available with 220-440-550 v, 60 & 25 cy. transformer

Allen-Bradley heavy duty push buttons have been redesigned to take advantage of the type of construction that has made A-B oiltight machine tool stations so popular.

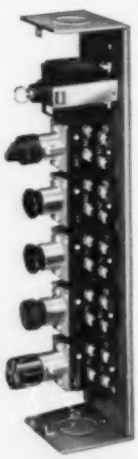
While the new Bulletin 800 heavy duty line is not oiltight, it uses contact blocks that have proved so dependable in the Bulletin 800T oiltight push buttons. Special heavy duty stations can be assembled on the job from a small stock of standard components.

Several types of operators are available, such as standard head, mushroom head, coin slot, key type, wing lever, and 2 or 3 position selector switches. The buttons can be supplied in different colors.

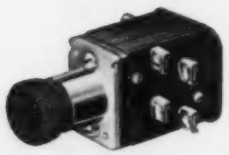
These push button stations can be easily arranged for either vertical or horizontal mounting —with the name plates reading correctly for the desired mounting.

Standard enclosures accommodate up to 8 buttons and pilot lights. Enclosures for more than 8 units can be supplied. Write for Bulletin 800.

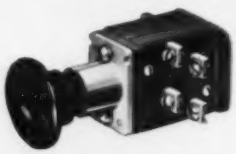
Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.
In Canada
Allen-Bradley Canada Ltd.
Galt, Ont.



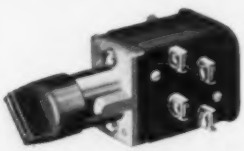
Five button station with pilot light



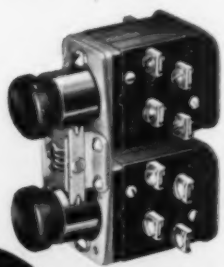
Type BK6B ext. head STOP button



Type DK6B mushroom head button



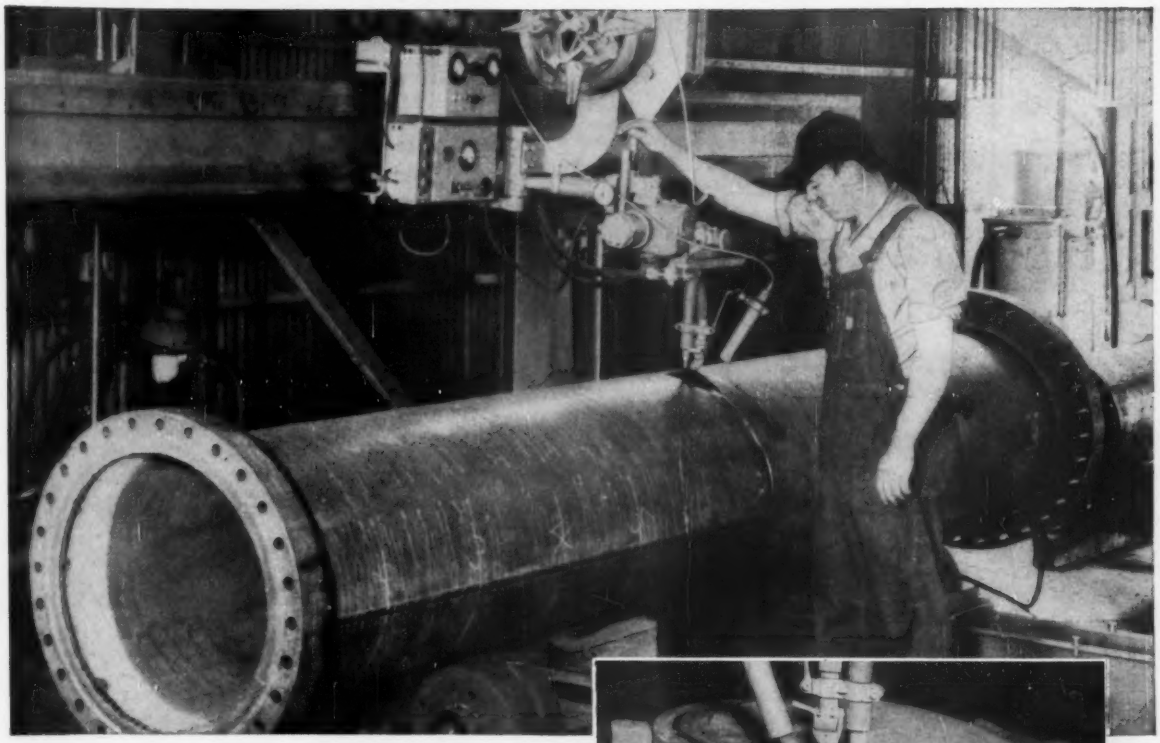
Type HK2B selector switch

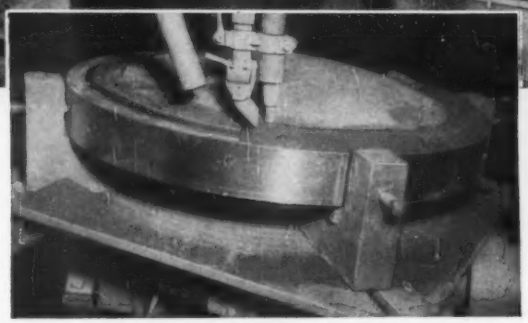


Type FK2B 2 button interlocked station

ALLEN-BRADLEY
MOTOR CONTROL

5-56-MR





# X-RAY-QUALITY WELDS ...75% FASTER *with* UNIONMELT WELDING

Top-quality welds are a must to assure the maximum service life of parts subject to high pressure and temperature. Like many manufacturers of pressure units, the Western Supply Company, Tulsa, Oklahoma is using UNIONMELT welding to make X-ray-quality welds (in heat exchanger shells) at new high speeds.

*** HIGH SPEED:**

UNIONMELT welding speeds average 15 to 19 in. per min.—this is as much as 75 per cent faster than welding methods previously used. The steel parts welded range from ½ to 3 in. in thickness, and welds are made in from one to three passes.

*** REDUCES GRINDING:**

Since UNIONMELT welding produces smooth, flat weld beads, the need for grinding completed welds has practically been eliminated—further reducing production costs.

UNIONMELT welding is the fast, efficient method of fabricating metals thicker than 18 gage. UNIONMELT welding makes possible increased fabricating speeds and lower production costs. Learn the details—call your local LINDE Representative for more information on UNIONMELT welding, and start saving today.

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**A Division of Union Carbide and Carbon Corporation**

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## A CINCINNATI PRESS BRAKE

# accurately forms this difficult shape

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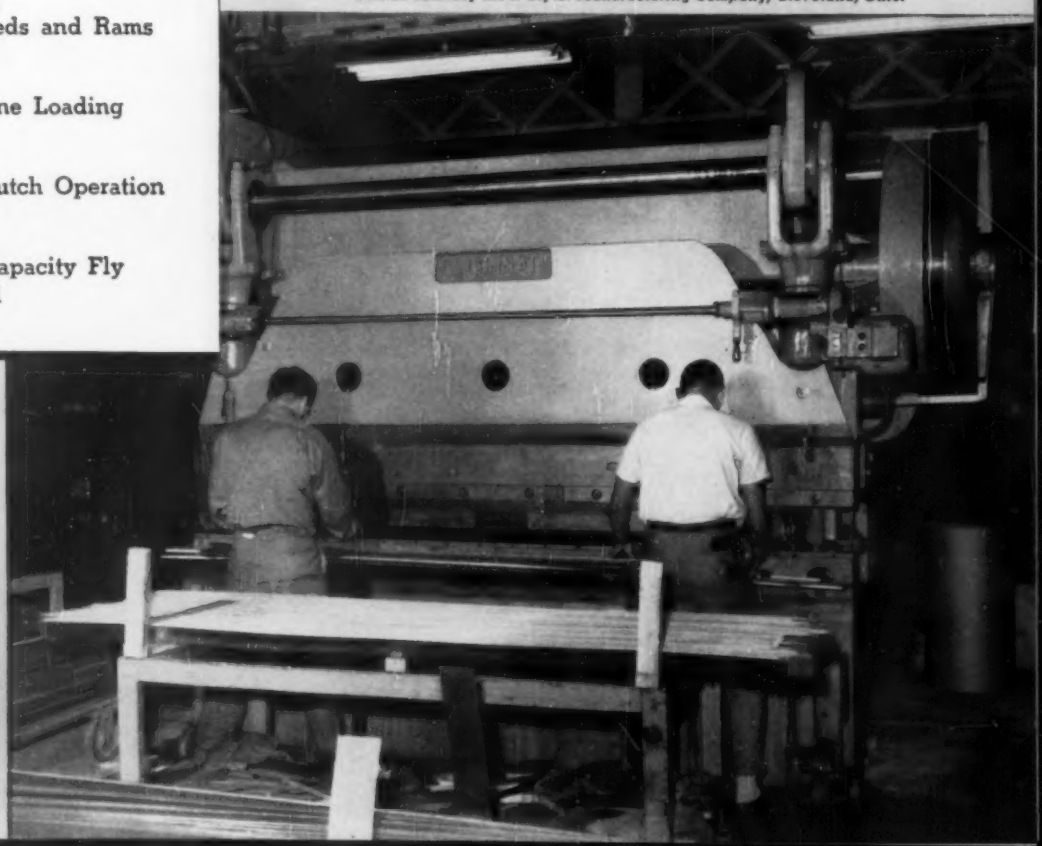
***Metal Fabricators***
**CLEVELAND, OHIO**

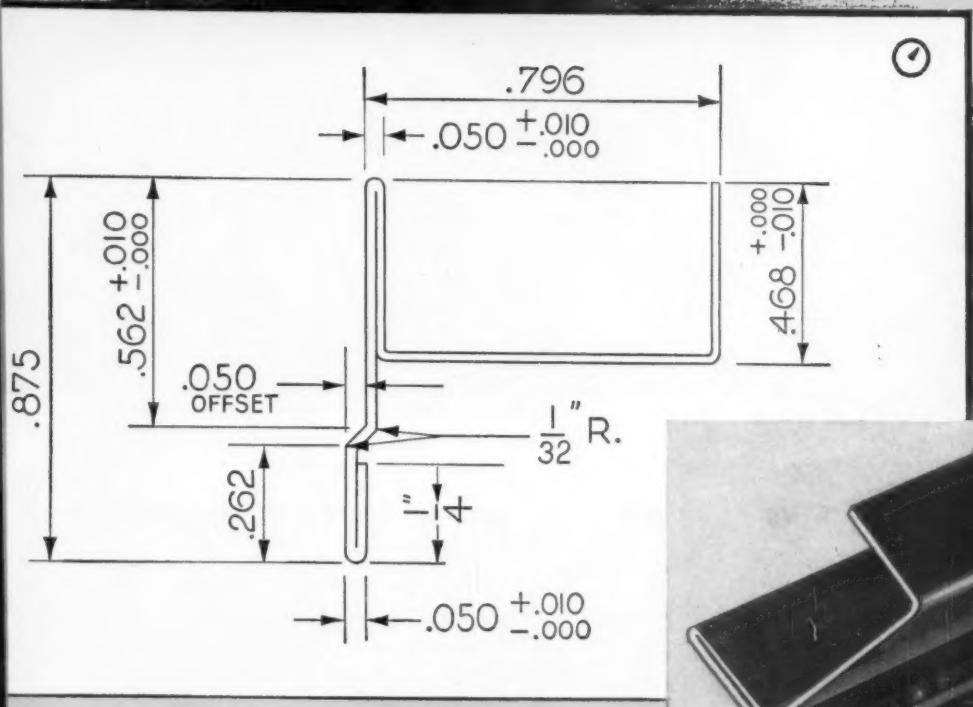
**Cincinnati Features**

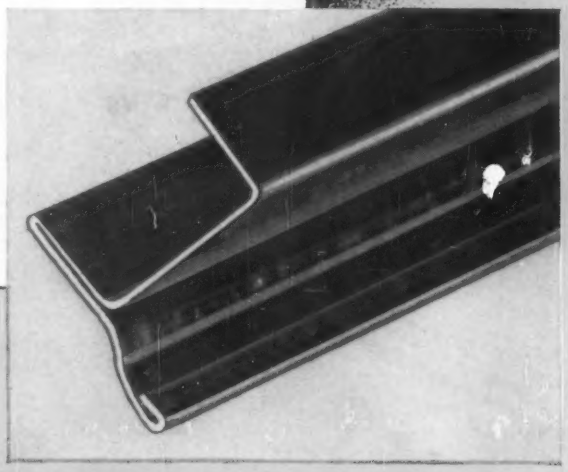
**Insure this Accurate Performance**

- All-Steel Interlocked Frame
- Deep Beds and Rams
- Centerline Loading
- Easy Clutch Operation
- Large Capacity Fly Wheel

*Photos courtesy the J. Clytel Manufacturing Company, Cleveland, Ohio.*





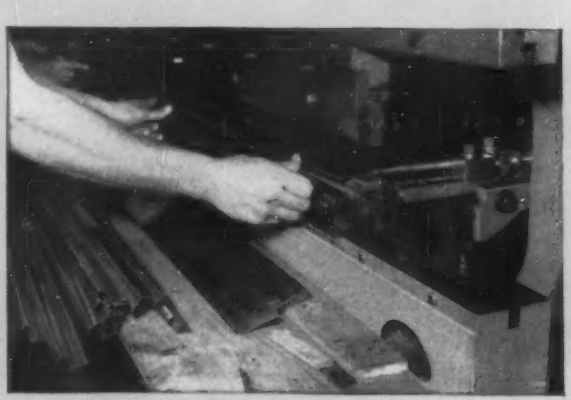



These galvanized steel channels for sliding window frames must be formed straight and true, and all dimensions held to close tolerances.

The Clytel Company say: "Our press room feels that only Cincinnati makes Press Brakes."

Consult our engineering department on your forming problems.

Write for comprehensive Brake Catalogue B-4.

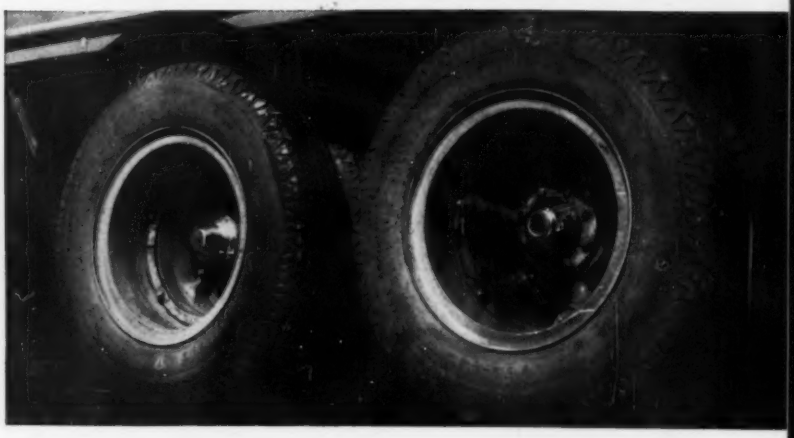


One of the efficient die set-ups used on this job

**THE CINCINNATI SHAPER CO.**

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI



**GRIP OF STEEL.** The steel reinforcing of the tire bead, upon which pneumatic rubber tires are built and which grip auto wheels securely, is made of high-quality CF&I-Wickwire Pneumatic Tire Bead Wire.

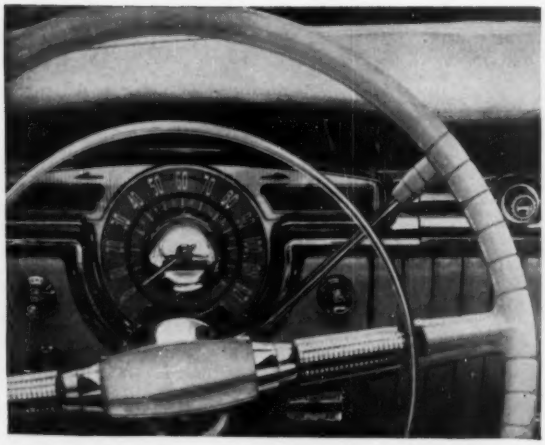
## *from tires to jar tops . . . wire works wonders*

**WELL PRESERVED.** The wire closure on these glass preserving jars holds the tops tightly, maintaining the air-tight seal. This clamp is made from CF&I-Wickwire Galvanized Clamp Wire.

**CF&I-WICKWIRE**

**MAKES WIRE FOR**

**THOUSANDS OF USES**



**FLEXIBLE POWER.** Speedometer cable is made of criss-crossed layers of CF&I-Wickwire Flexible Shaft Wire.

**SHADES OF NIGHT.** The curtain springs in window shade rollers are made from tempered CF&I-Wickwire Spring Wire.

**ALL WRAPPED UP.** CF&I-Wickwire Baling Wire is used in baling hay, straw, and other bulky farm products.

**TO PLUMB THE DEPTHS.** An invaluable part of every plumber's kit is his plumber's snake made of CF&I-Wickwire Snake Fishing Steel Wire.

It's no wonder that wire is all-important in hundreds of different industries...for its properties can be custom-tailored to just about any need. Are you concerned with assembly work, manufacturing, processing? Do you require wire that's fine or coarse, hard or soft, round or shaped? Then the chances are excellent that a CF&I-Wickwire Wire will more than fill the bill.

CF&I-WICKWIRE, with over a century of experience in the manufacture of wire, is always ready to serve you from plants conveniently located from coast to coast. Call or write our nearest district sales office for detailed information.

# CF&I-WICKWIRE WIRE

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WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

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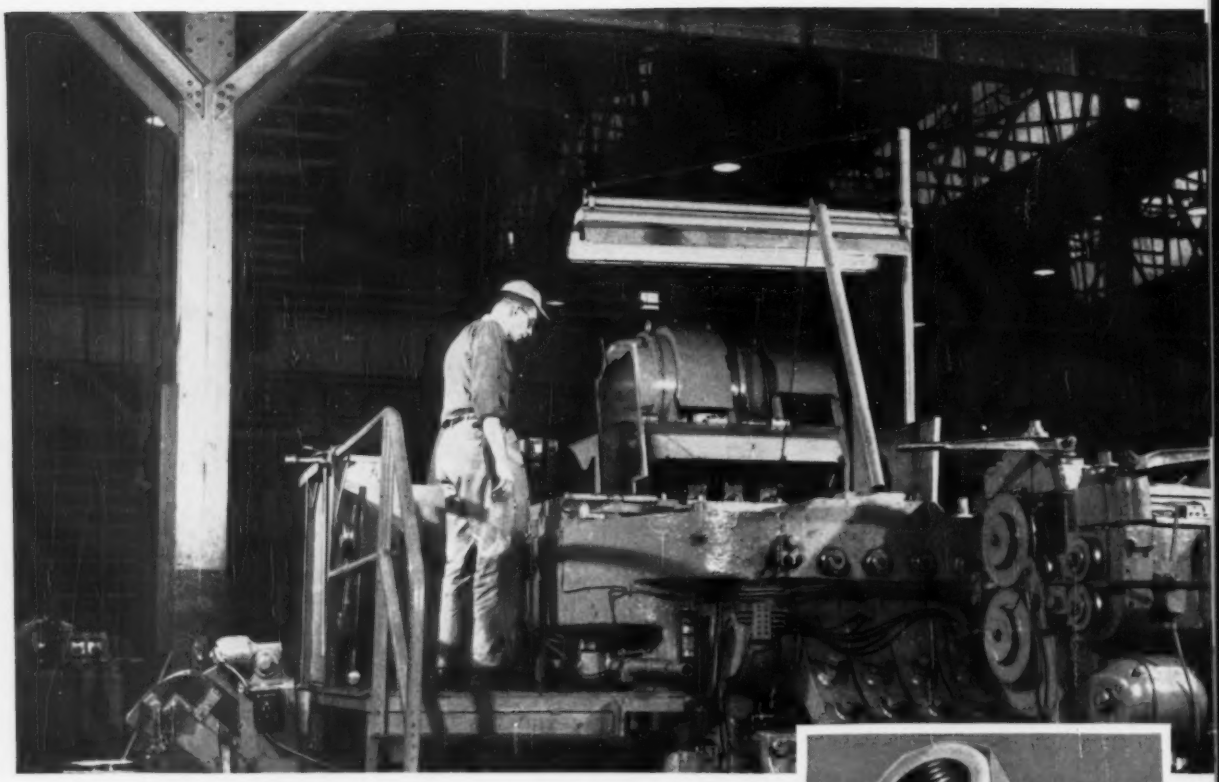
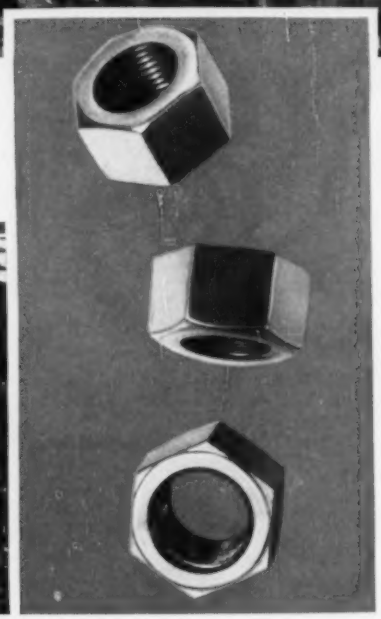


**SPECIALIZED PRODUCTION EQUIPMENT,** like this modern nut former, is representative of hundreds of high-speed automatic machines located at Republic's giant Bolt and Chain Division. From incoming steel billet to finished fastener product, every step in manufacture is controlled by skilled workmen using machine tools specifically developed to maintain uniform quality in each type of fastener.



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REPUBLIC STEEL

*World's Widest Range of Standard Steels*

The case for FASTENER SELECTION

# Modern facilities increase fastener dependability

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That's what we have at Republic—a coordinated team of individual experts, working with the finest available equipment. A team that builds bolts and nuts every step of the way from raw ore to finished product, eliminating any chance of errors being introduced by outside suppliers.

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So don't just order fasteners, *select* Republic and be sure of the best. Your Republic Bolt and Chain Division representative or distributor will be glad to work with you to make sure you get exactly the right fastener to suit your application. He is backed by an array of 20,000 standard types and sizes plus 8,000 specials. And, if you should need something still different, Republic can undertake volume production of headed and threaded items manufactured to your exact specifications.

Mail the coupon today for full information.

**TOP-NOTCH PRODUCTION FACILITIES** go to work as an extension of your own plant when you have your stamped and drawn parts fabricated by Republic's Pressed Steel Division. This truck pedal shaft bracket is one of a wide variety of steel parts mass-produced for large-volume manufacturers. Send coupon for data.

**DEPENDABLE TUBULAR PRODUCTS** begin with top-quality carbon steel and stainless steel tubing. Specify Republic ELECTRUNITE® Tubing to be sure of uniform diameter, wall thickness, concentricity, strength and ductility. These characteristics back your production facilities, simplifying and speeding output of superior parts, like the immersion heater casing shown above. For complete information on ELECTRUNITE Tubing, mail coupon today.

**UNIFORM DEPENDABILITY IN ALL SIZES** is yours no matter what type of Republic fastener you require. Take Hex Head Cap Screws for example. Republic offers fine or coarse threads to suit your application in diameters from ¼ inch to 1½ inches inclusive, and lengths up to 12 inches. Send coupon for literature.

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**3104 East 45th Street, Cleveland 27, Ohio**

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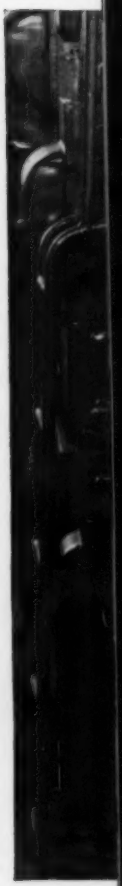
Company_____

Address_____

City_____ Zone____ State_____

# "We have no operating problems

*Midwest Metal Stamping reports results of 8 years of press operation using STANOIL*



In 1948, Midwest Metal Stamping Company, Kellogg, Iowa, put into service a Bliss Hydro Dynamic Press. STANOIL Industrial Oil was selected as the hydraulic medium. The initial fill was 1,400 gallons. The press operated continuously from 1948 until Christmas, 1954, when it was shut down five days for overhaul.

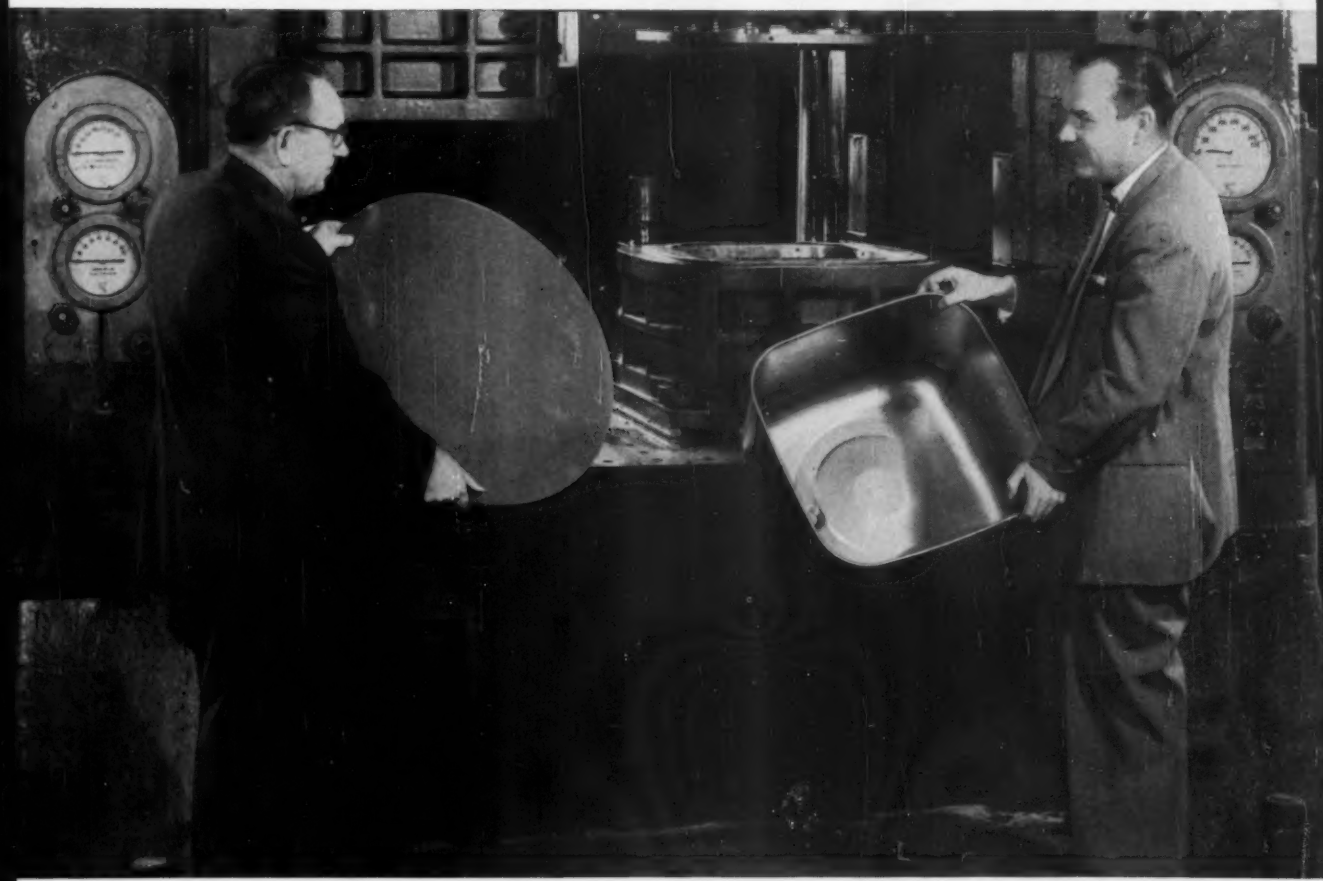
Stamping being removed from press by operator George Johnson. Press has used STANOIL Industrial Oil as hydraulic medium for eight years. Oil has perfect performance record.

**At the time of overhaul,** the STANOIL Industrial Oil was drained. And here STANOIL's superior demulsibility was demonstrated. Due to the high rate of condensation, two barrels of water were removed from oil reservoir. An oil analysis in the Standard Oil laboratory proved the oil still suitable for continued service. After filtration, it was returned to the reservoir and the press put back in operation. STANOIL continues to deliver the same perfect performance for Midwest as before.

**STANOIL Industrial Oil** can perform just as efficiently for you. Find out. There is a Standard Oil industrial lubrication specialist near you in any one of the Midwest and Rocky Mountain states. Call him. Or write Standard Oil Company, 910 South Michigan Ave., Chicago 80, Illinois.

# when we use STANOIL Industrial Oil"

Don Foster, Midwest Stamping Purchasing Agent and Jesse Nelson (right), Standard Oil industrial lubrication specialist, display metal blank and finished tub turned out on Bliss press. Technical service on lubrication problems is Jesse Nelson's job. He's been doing such work for seven years. Jesse has an engineering degree from the University of Iowa and is a graduate of the Standard Oil Sales Engineering School. Customers find this experience and training pay off *for them.*



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**STANDARD OIL COMPANY**
(Indiana)

*Quick facts about* ***STANOIL*** *Industrial Oil*

- **Special refining and an additive, exclusive with STANOIL, make this industrial oil resistant to chemical change.**
- **In all grades of STANOIL that need it, an advanced type corrosion inhibitor is added. Inhibitor "plates out" on metal surfaces, prevents rust.**
- **Selective refining and special additives give STANOIL low pour point. STANOIL flows freely at low temperatures.**
- **High viscosity index of STANOIL is indication of the oil's ability to resist change at any operating temperature.**
- **No foam, no emulsion with STANOIL. STANOIL's special additive and selective refining minimize or eliminate these oil problems.**
- **Low carbon forming tendencies of STANOIL reduce or eliminate this problem.**

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When it comes to abrasives, a foundryman needs to know two things. How does it clean? What does it cost in operation? Different jobs may require different abrasives but the result should always be the same—a *good* job at *lowest cost.* Malleabrasive and Tru-Steel abrasives give you that. Whichever you need, Pangborn makes sure you get the right abrasive for every job. Talk to one of our sales engineers or order from Pangborn Corp., 1500 Pangborn Blvd., Hagerstown, Md.

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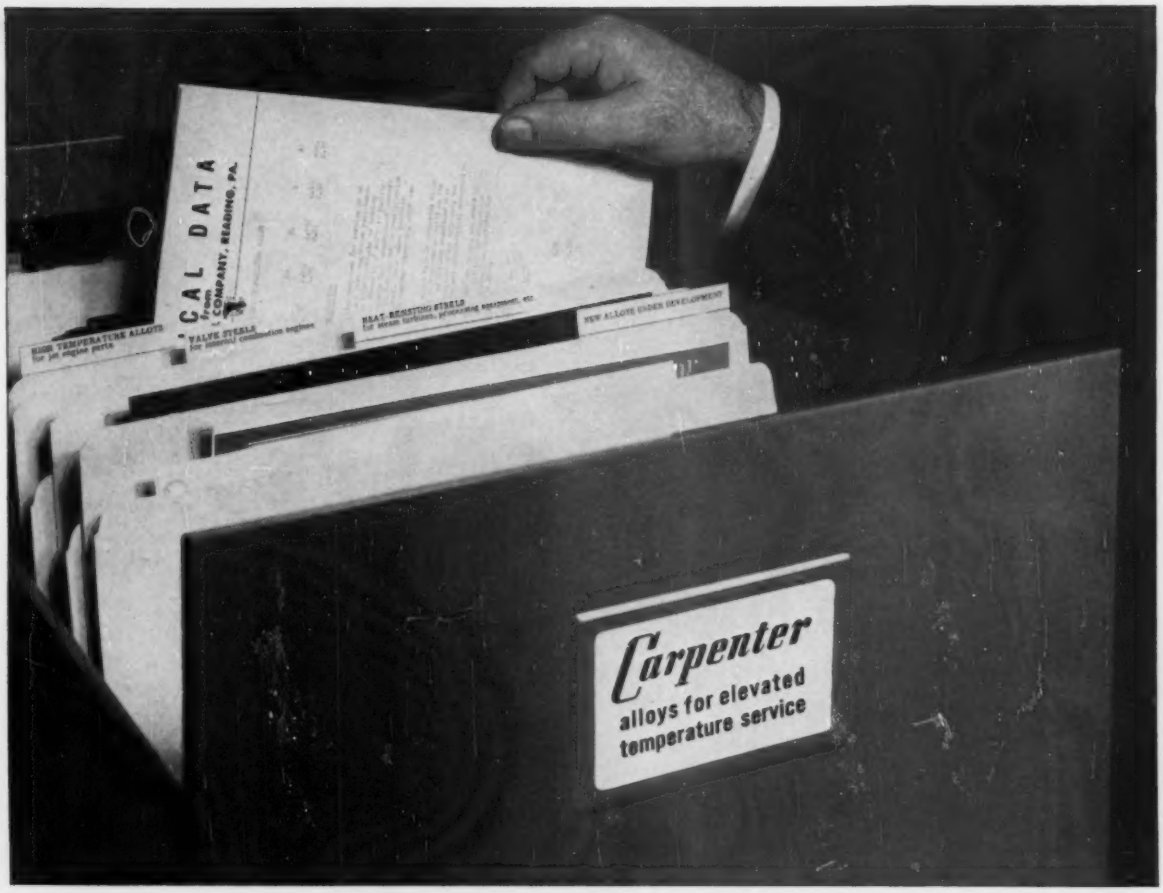


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Exciting possibilities for improvement are ahead when you look into the line of Carpenter alloys for parts or products in elevated temperature service. Here is a line of high temperature and heat-resisting alloys produced in a *specialty* mill. Only a true specialty mill can produce so well these very difficult-to-make alloys.

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Outline your plans or problems to your Carpenter Reprsentative or write direct. You'll get the kind of help that pay's off with definite improvements. *The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.*

**Specify Carpenter alloys for elevated temperature service and get these three big advantages . . .**

Improved Forgeability
Greater Uniformity
Cleaner Steel

**Carpenter STEEL**

**Improved Alloys for Elevated Temperature Service**

the

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steel for the man in a hurry—our efficient warehouse methods permit fast delivery on a moment's notice from your J&L Warehouse

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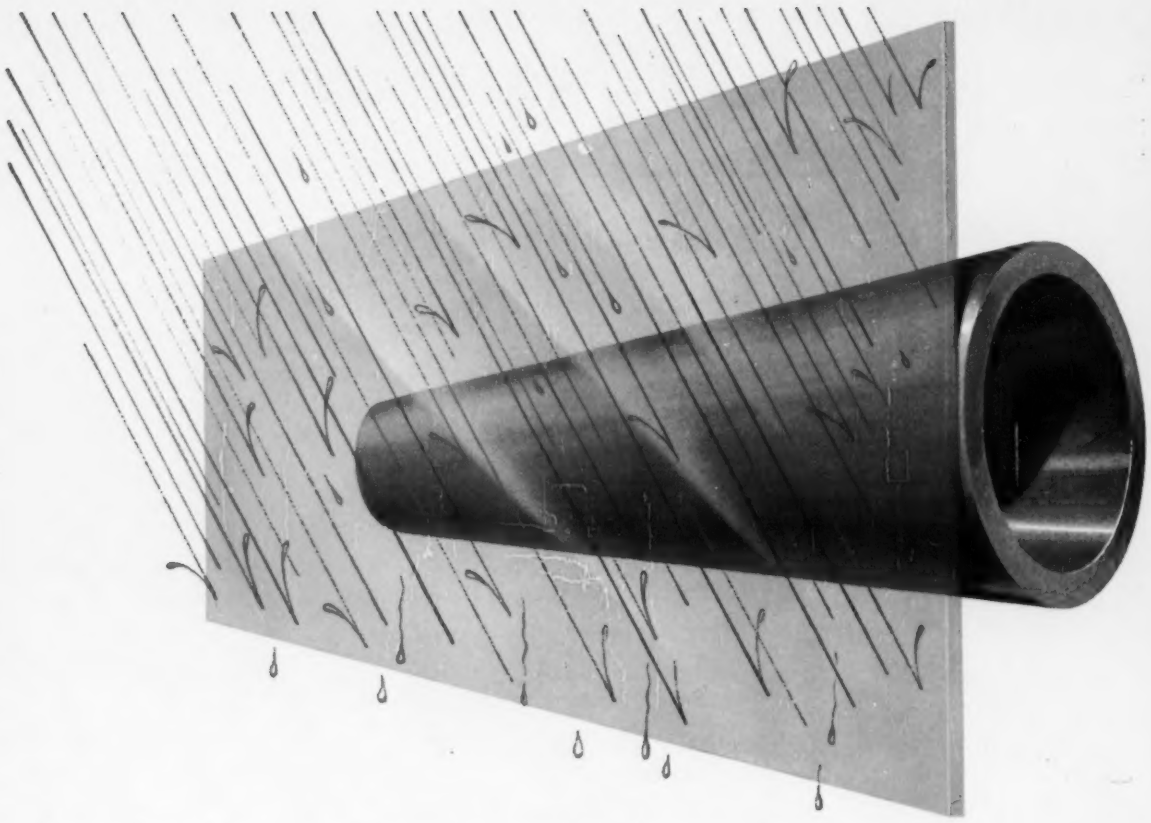

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Houghton Rust Veto 344 seals moisture from metal the year 'round with one application. Its tough, thin (.003") film gives long-lasting outdoor protection to steel and non-ferrous metals.

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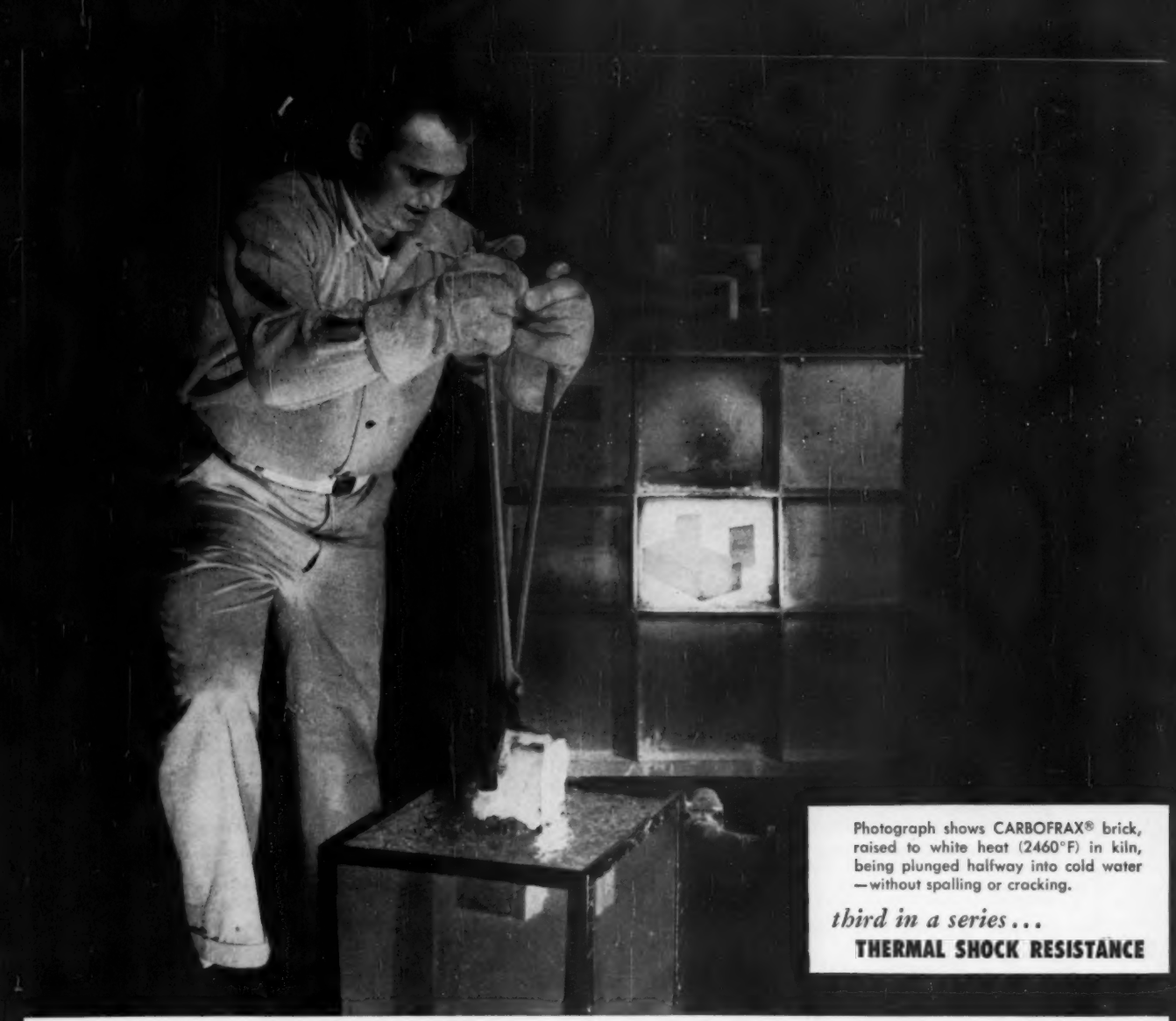
*Ready to give you on-the-job service . . .*



Photograph shows CARBOFRAX® brick, raised to white heat (2460°F) in kiln, being plunged halfway into cold water—without spalling or cracking.

*third in a series . . .*

**THERMAL SHOCK RESISTANCE**

# Unusual Properties of Refractory Materials

**Thermal Shock Resistance** in a refractory enables it to withstand rapid recurring temperature changes without spalling and cracking. Several properties affecting the degree of resistance include: thermal conductivity, ultimate strength, thermal expansion and modulus of elasticity.

A number of refractories developed by Carborundum are noted for having these properties in the ranges that insure high heat shock resistance. They successfully meet the stresses and strains imposed by intermittent firing and by high heat releases in restricted areas. In packaged steam generator service, for example, they are far superior to other lining materials. Similarly, they have produced outstanding results in rapidly-heated quickly-cooled crucible type melting furnaces, in heat treating furnaces, incinerators, still settings, etc.

The current issue of Carborundum's magazine "Refractories" features a comprehensive article on heat shock. It may offer suggestions helpful to you in handling a condition of this nature. Send for your copy today.

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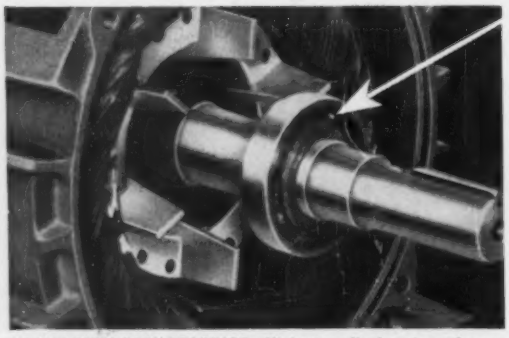
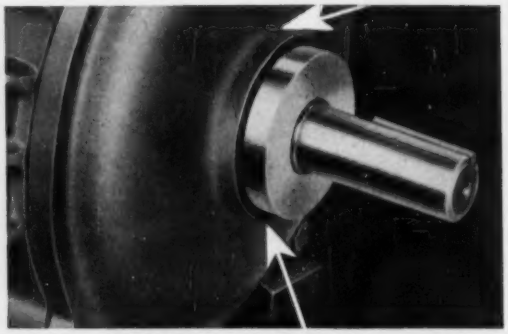
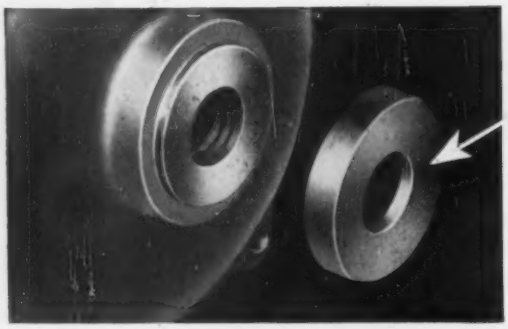


**HEAVY-DUTY BALL BEARINGS**—Highest quality bearings of more than ample capacity to carry heavy loads provide long trouble-free service.



**BEARINGS CAN BE RE-LUBRICATED**—These Wagner motors can be re-lubricated when necessary to prolong bearing life. New grease can be added—old grease removed through openings provided in top and bottom of bearing housing.



**BEARINGS STAY CLEAN**—Both ends of these motors are equipped with running shaft seals to keep dirt, dust and water from the bearings. There's no grease loss because bearing housings have effective seals to prevent escape of grease.

**EASY TO CONNECT**—Large diagonally-split conduit box which can be mounted in any of four convenient positions, provides ample room for making connections. Leads are readily identified by numbers stamped on the terminal bushing.

## Wagner totally-enclosed motors mean less down-time for machine tools

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Wagner totally-enclosed fan-cooled motors are particularly suitable for use on all types of machine tools.

They are fully protected against damage from steel filings, chips, dust, dirt, fumes and moisture. They require no maintenance other than periodic lubrication.

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Ribs on the corrosion-resistant cast iron frames add mechanical strength and increase the surface area for more efficient cooling. Full information and principal dimensions are given in Bulletin MU-203 which is yours for the asking.

Your nearby Wagner engineer can help you select the right motor for your applications. Call the nearest of our 32 branch offices, or write us.

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M56-7

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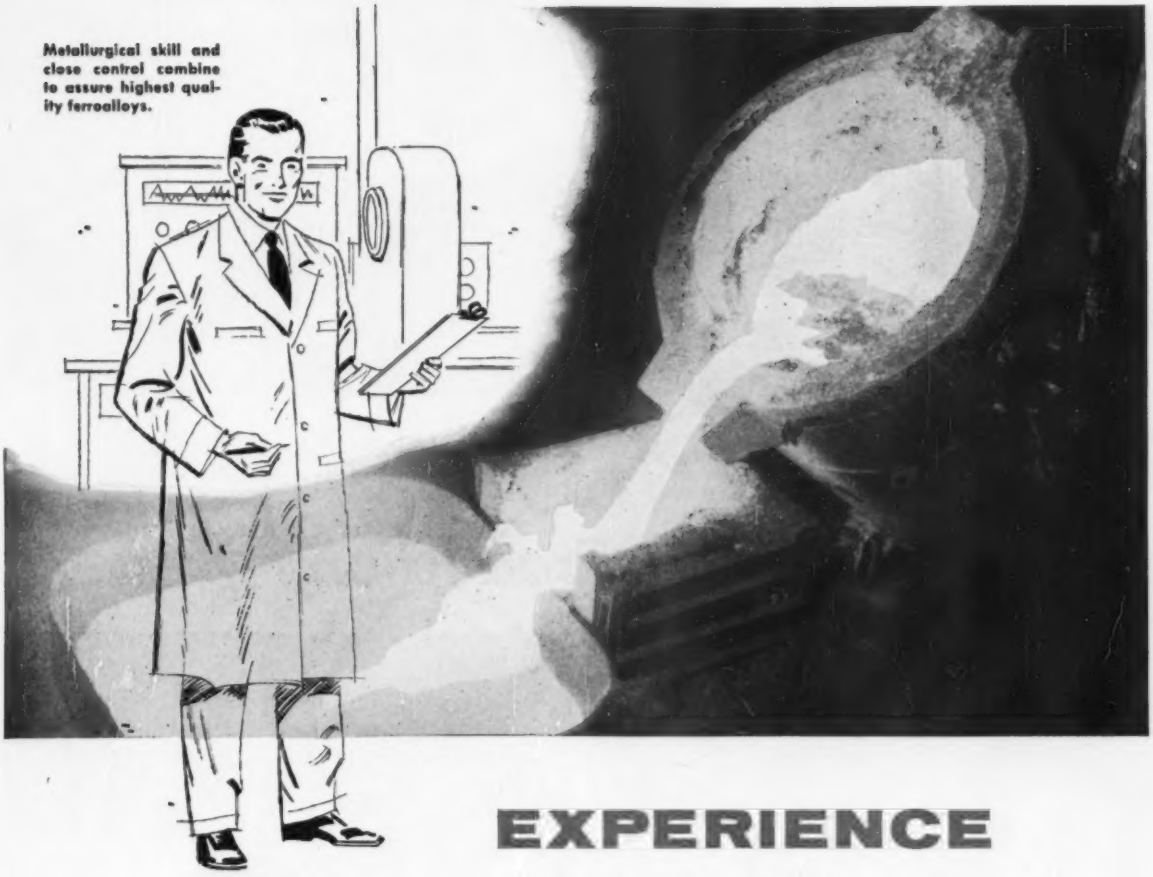

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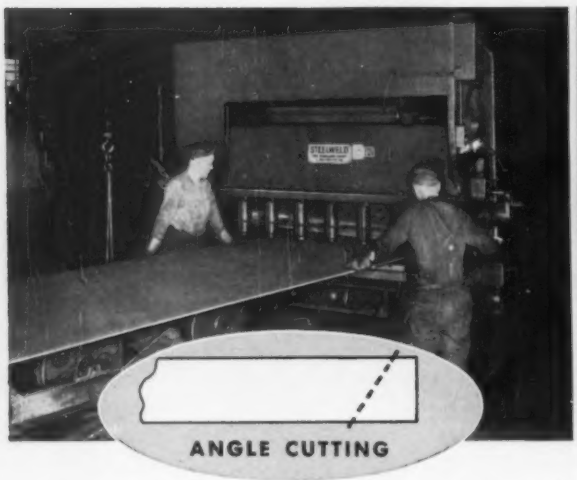
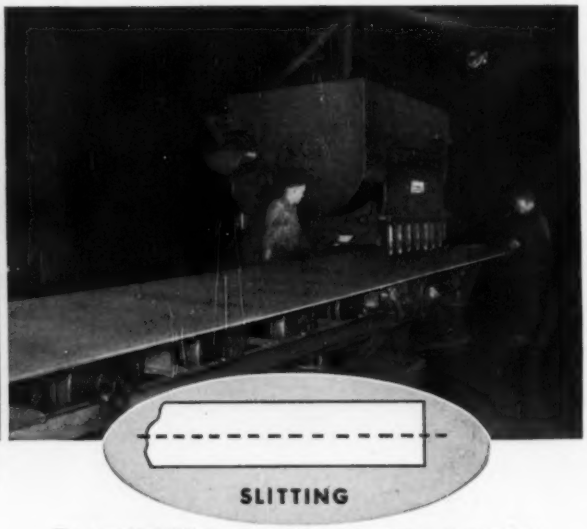



Because of the deep throat in end housings, larger size sheets or plate can be cut at various angles than possible with most shears. This is also a great advantage when notching and slitting.




The standard 24" throat depth permits slitting sheets up to 48" wide on any line. 36" throats are also available for larger machines.

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The New Peninsular "3Z" Wheel's unusual combination of extra-dense, lasting structure and faster-cutting action meets the approval of managers, foremen, and operators. Managers appreciate the greater profit that results from using a "3Z" Wheel. Foremen approve the longer life of the "3Z" Wheel —there's less downtime to worry about. Operators are sold on the record-breaking grinding action of the "3Z" Wheel, for this ups production and makes for easier handling—cuts worker fatigue to a minimum. You can prove to your own satisfaction there's no grinding wheel quite like the New Peninsular "3Z" unit. Peninsular abrasive engineers will call and show you how your toughest slab, billet or other heavy duty grinding problem can be solved by this latest Peninsular advancement in abrasive engineering.

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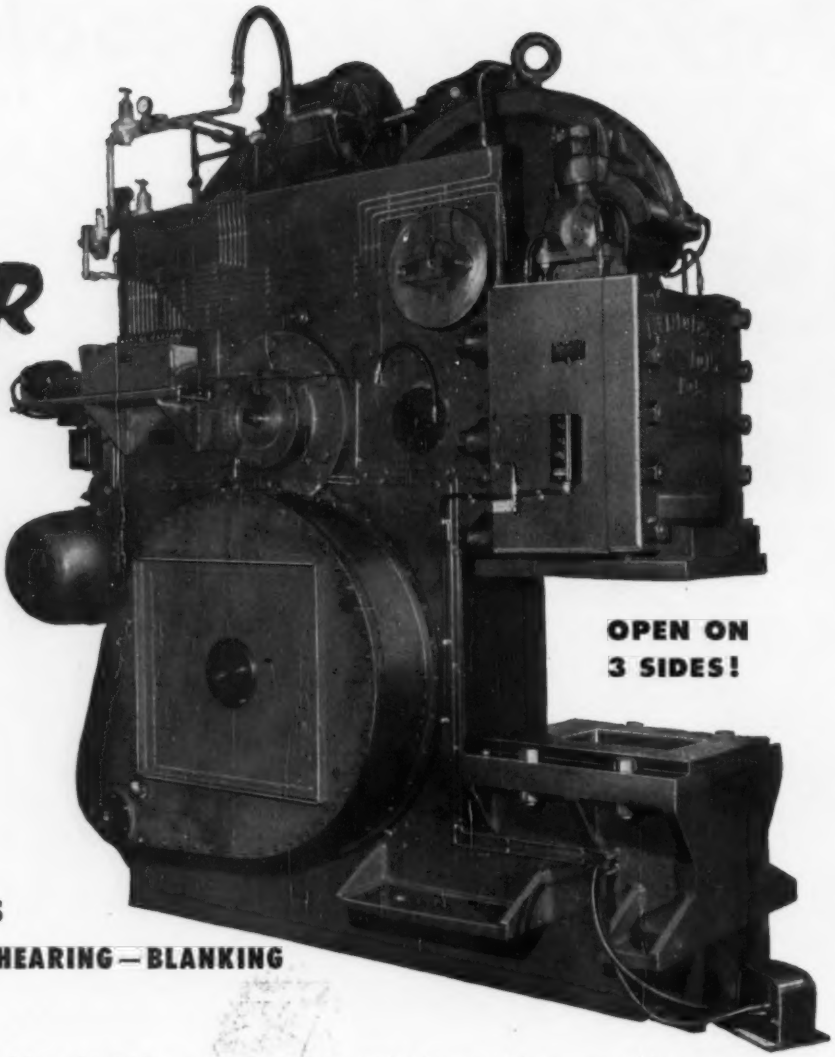

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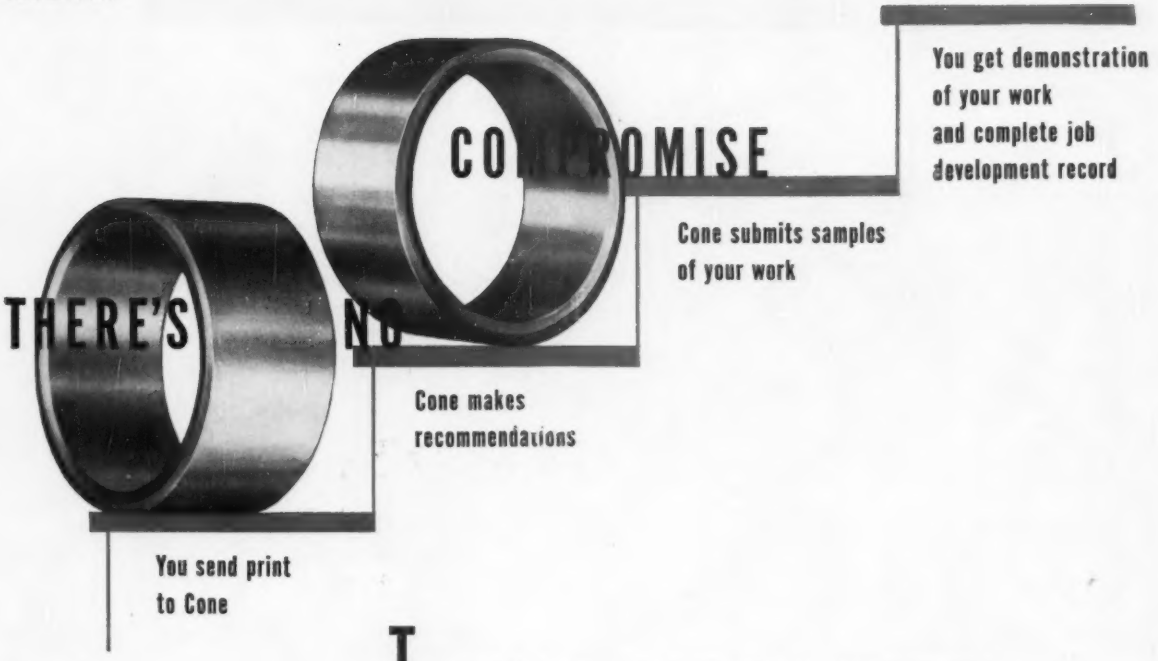
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The Conomatic Carbide Development treats each job individually from standpoint of work, machine, tools, and operating personnel.

DATA FOR COMPARISON

| | |
|---|---|
| Part.....Bushing | Length.....⅝" |
| Machine.....1⅝" Conomatic | Hole Dia.....1¼" |
| Tools.....100% Carbide Tipped | RPM.....825 |
| Material.....8620 | Time.....14.8 Secs. |
| Stock Size.....1⅝" | |

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CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

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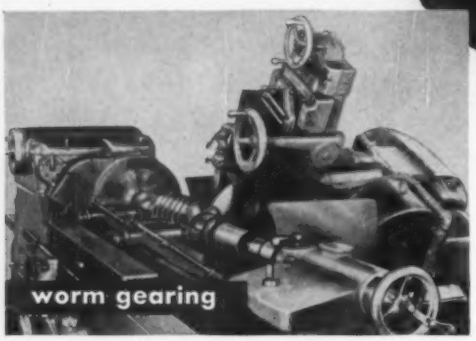
# WORM GEARING

## by "Phillie Gear" assures you accuracy... efficiency ...dependability




Worm grinding is an operation which is essential to successful worm gear operation... When worms are heat-treated for maximum surface hardness, the hardening process often produces changes in the lead angle and tooth profile, and always leaves a rough scaly surface on the threads. Worm thread grinding will correct errors of lead and profile, and produce a mirror-smooth surface finish, which is highly important to worm gear tooth action. Philadelphia worms up to 12" pitch diameter, 1 diametral pitch, are thread ground on our modern equipment.

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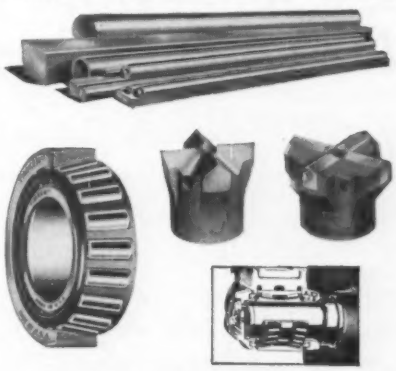

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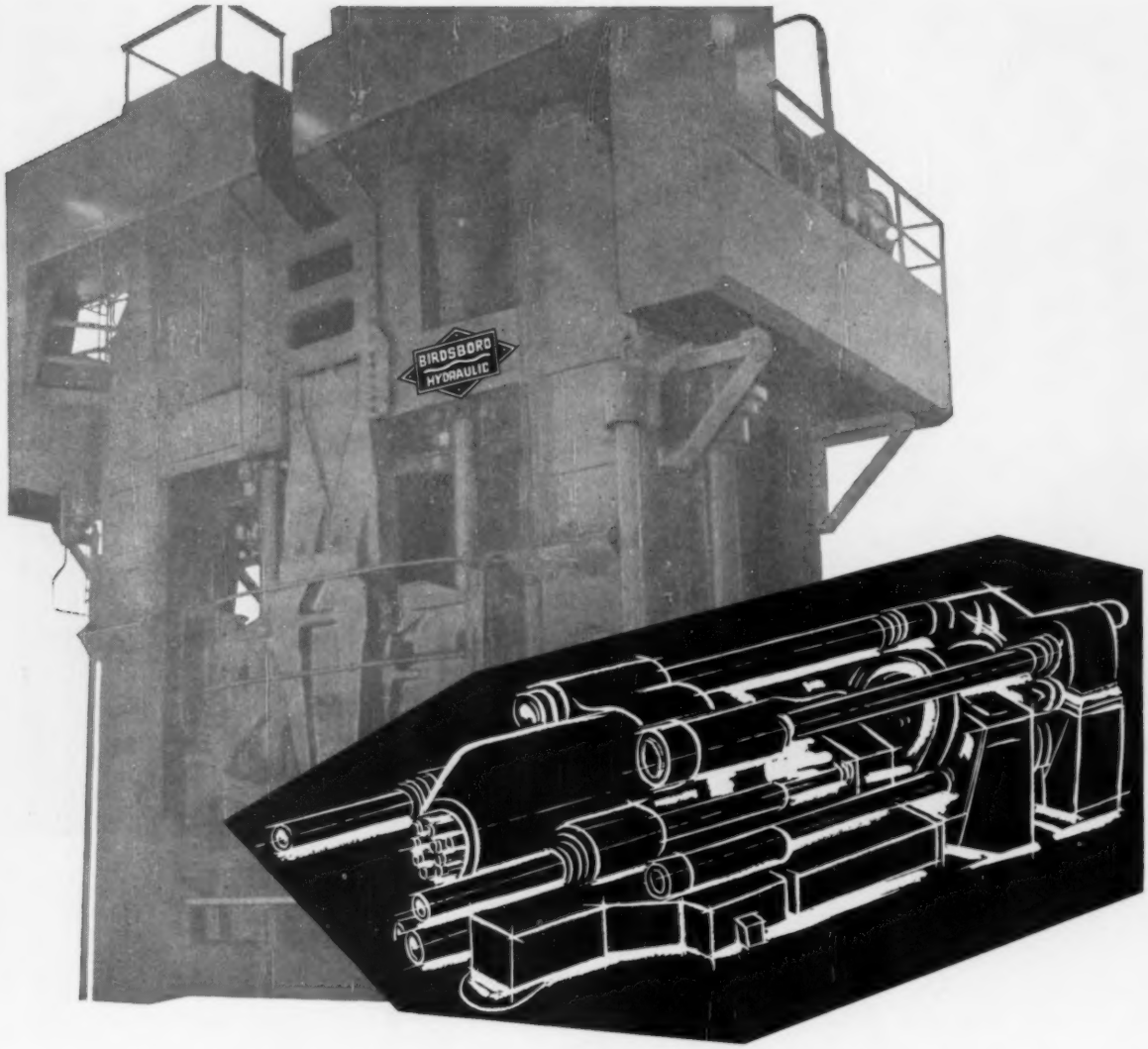


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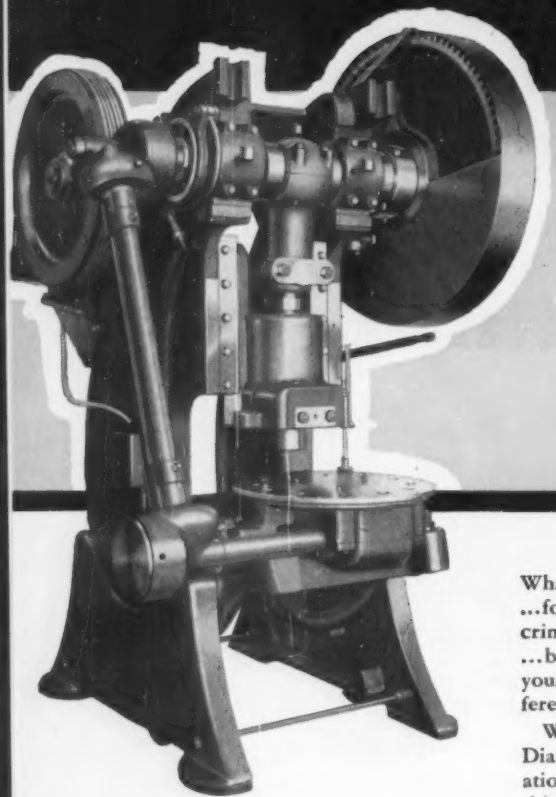

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# The Columbium Shortage Is Over!

# "Electromet" Ferrocolumbium

## *is now available for Stainless Steel and High-Temperature Alloys*

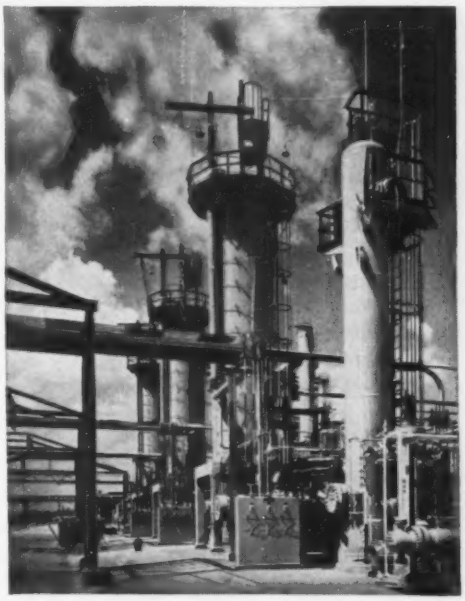
The development of high-speed aircraft has produced a wide-spread demand for high-temperature alloys containing columbium.

Now that the government stock-piling program on columbium has been completed, ample supplies of columbium are once again available for defense and civilian uses. This is important news, as industry may now use this valuable alloying element to attain good high-temperature properties in stainless steel and non-ferrous alloys.

Columbium is added to austenitic chromium-nickel stainless steels to prevent intergranular corrosion and improve strength at high temperatures. A columbium addition of 10 times the carbon content will stabilize stainless steels at temperatures of 800 to 1600 deg. F., thus preventing impairment of corrosion resistance and physical properties. In the high-temperature alloy field, 0.2 to 4.0 per cent columbium will preserve the strength of super-alloys during long exposures to temperatures up to about 1550 deg. F., or slightly higher.

ELECTROMET furnishes columbium in two forms: ferrocolumbium and ferrotantalum-columbium. Ferrocolumbium contains 50-60 per cent columbium, while ferrotantalum-columbium contains approximately 40 per cent columbium and 20 per cent tantalum. Both of these ferro-alloys are available in a number of crushed sizes and give a 90 per cent recovery of columbium.

**For further information** about ELECTROMET columbium alloys, please contact the nearest ELECTROMET office listed below.



Columbium-bearing stainless steels are widely used in chemical equipment where resistance to corrosion at high temperatures is necessary.

## Electro Metallurgical Company

**A Division of Union Carbide and Carbon Corporation**

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# ALTEMP

## HIGH TEMPERATURE SUPER ALLOY STEELS

**ALTEMP A-286** . . . an austenitic iron-nickel-chromium alloy made heat-treatable by the addition of titanium. Designed to maintain high strength and corrosion-resistance up to the 1350 F range, and to afford satisfactory scale resistance up to 1800 F.

A-286 was developed in the A-L Research Laboratory in Watervliet, N.Y., in the 1949-51 period. Among the high-strength, heat-resisting alloys, it has exceptionally low strategic alloy content, improved hot-working and machining qualities, and good center ductility in large sections. Currently used in jet engines and superchargers for such applications as turbine wheels and blades, frames, casings, afterburner parts, bolting, etc.

This alloy is readily produced in large quantities without the need of special steel-making equipment. It is available in the form of billets, bars, forgings, sheet, strip, tubing and hot-extruded shapes.

**ALTEMP S-816** . . . a chromium-nickel-cobalt base alloy, strengthened by additions of molybdenum and tungsten, and with a columbium-carbon ratio of ten to one to insure its structural stability. Designed for high strength and corrosion-resistance service in the 1200-1500 F range, and at higher temperatures under lower stress conditions. Developed in the A-L Research Laboratory at Watervliet, N.Y. in the years of 1940-43, and engine-tested and proved for periods of over 30,000 hours.

S-816 is used currently for turbine blades in two of the production jet engines, also in a number of experimental aircraft and commercial gas turbines. Except for seamless drawn tubing, it is available in practically all forms and shapes in which stainless steels are processed, including hot extrusions.

**ALTEMP S-590** was designed for service in the range of 1100-1400 F temperatures where high strength and corrosion resistance are required, and where cost is also a factor. Unlike S-816, which is practically a non-ferrous alloy, S-590 has a chromium-nickel-cobalt-iron base. However, it employs the same molybdenum and tungsten additives, and the same columbium-carbon ratio.

S-590 was developed at the Watervliet Laboratory and field-proved during the same years as S-816. It is available in the same shapes and forms, and is currently being used for turbine blades and wheels in experimental commercial gas turbines.

**OTHER GRADES** . . . among the many other Super Alloys made by Allegheny Ludlum are V-36, M-252, 19-9 DL, 19-9 DX and Waspaloy.

Do you have a high temperature problem? The services and experience of our Research Laboratories and Technical Staff are completely at your command. *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

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Certified laboratory data on the properties of Allegheny Ludlum high temperature Super Alloy Steels are yours on request.

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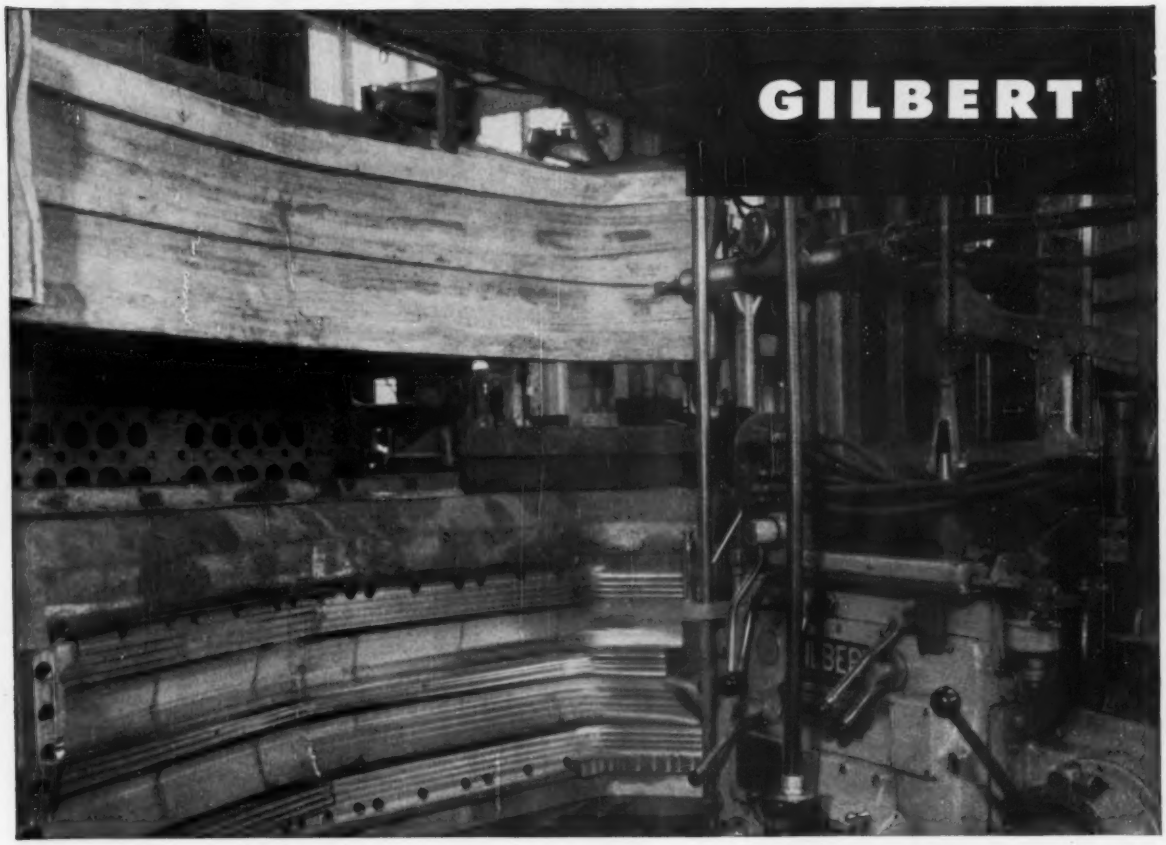
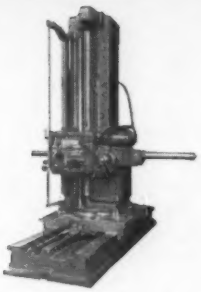



# add reverse curves to your machining pitch



"The Gilbert revolving column boring mills, together with the very accurate Goodrich follower, make possible the machining of deep cavity, steep side dies complete in one position of the work piece.

"It is also possible to machine cupped ends or reverse curves without having to move the job."

These are the words of Mr. Ed Miller, President of the Lansing Tool & Die Company, Lansing, Mich. With his two Cincinnati Gilbert Floor Type boring mills, he has offered customers machining services which couldn't be done on any other horizontal mills. Other equipment capable of doing these jobs costs several times more than the Gilberts.

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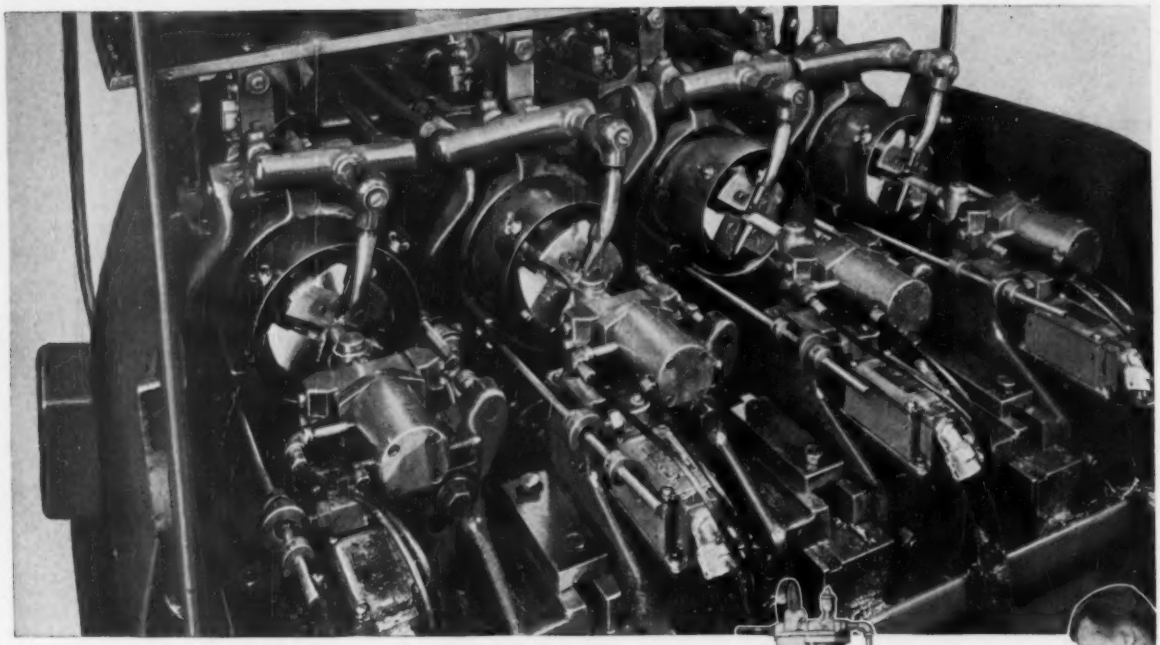
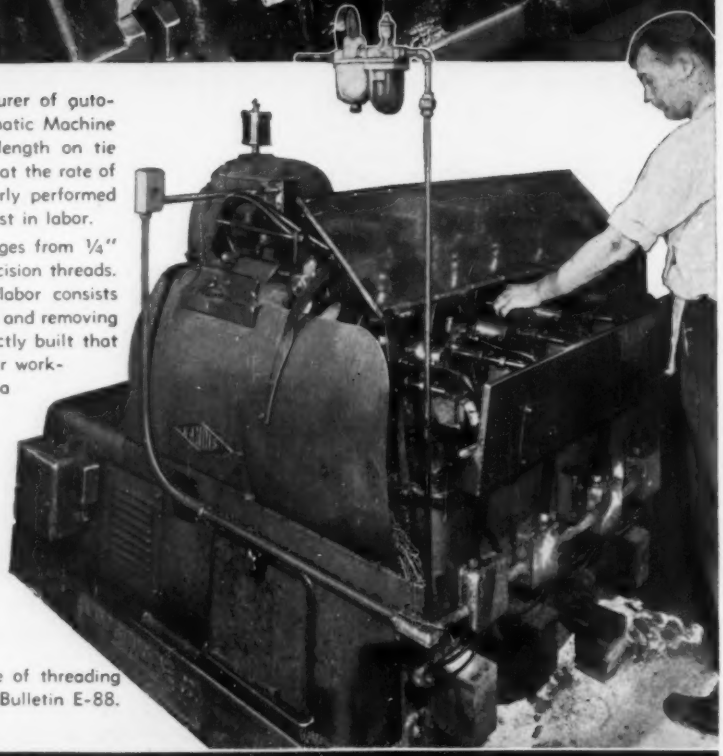
You can buy a new Gilbert floor type horizontal boring mill with 60" vertical and 72" horizontal travel on a 5-year payment plan for as little as $4040 down and $303.50 a month. This is 91c an hour on a two 8-hour-shift operation. Includes low 6% simple interest (3% add on).

*those who buy Gilbert buy* **GILBERT** *again*

# Labor Cost Slashed 50%

## ...WITH ***LANDIS*** SEMI-AUTOMATIC MACHINE





Illustrated in the plant of a large manufacturer of automobile parts is a LANDIS 4 Spindle Semi-Automatic Machine mass-producing 7/16" 18-P threads 2¼" in length on tie rod sockets. The threads are cut to a Class 3 fit at the rate of 520 pieces per hour. This operation was formerly performed on a double-spindle machine . at twice the cost in labor.

This machine, whose diametrical capacity ranges from ¼" to 1", is designed for the mass-production of precision threads. During the operation illustrated here, manual labor consists merely of placing the blanks on work-holding pins and removing them when threaded. The machine is so compactly built that one operator can easily reach any one of the four work-loading stations from a fixed central position—a feature which enables one man to do the work of two with minimum operating fatigue.

Through the combined output of four die heads, high production is obtained at comparatively low spindle speeds. This feature not only results in finer thread finish, but also greatly extends chaser life, thus effecting a sharp reduction in tool cost. Other advantages inherent in the LANDIS 4 Spindle Semi-Automatic Machine include: quick set-up; thread concentricity; elimination of side-shave; and adaptability to a wide range of threading operations. For complete information, write for Bulletin E-88.

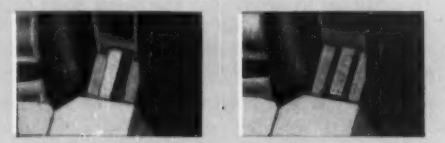
**LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA**

**MORE FACTS on why more and more leading manufacturers choose Link-Belt bearings**

**EASY, LOW-COST INSTALLATION**—Series 400 bearing blocks are quickly mounted on commercial shafting from ¾ to 4-in. diameters.

**HEAVY COLLAR SECURELY LOCKS INNER RING TO SHAFT.** Use of setscrews in collar avoids distortion of inner ring. Tension of collar against heavy setscrews assures tightness.

**FREE ROLLING—SELF-ALIGNING.** Spherical inner ring is free to align in any direction. Load is distributed over entire roller assuring full load capacity. Destructive edge loading cannot occur.



**CONTACT-TYPE SEAL,** left, of felt laminated with synthetic rubber for extremely dirty conditions. **LABYRINTH SEAL,** right, for normal conditions. Bearings are pre-lubricated and sealed at factory.

Series 400 roller bearings—complete Link-Belt line includes ball and roller bearing pillow blocks, flange, flange cartridge, cartridge and take-up blocks.

# Fast, easy mounting

## —a key feature of these self-aligning, high-capacity roller bearings

● Hundreds of equipment manufacturers who use roller bearings choose the popular, high-capacity Link-Belt Series 400. Compactness promotes neatness of machinery design . . . easy mounting reduces installation costs. And field service has developed an unmatched performance reputation because of many valuable features.

Series 400 pillow blocks are equipped with self-aligning, double-row roller bearings. Even under shaft deflection and misalignment, bearing maintains full load capacity during its long life.

This quality bearing is part of industry's most complete line of ball and roller bearing blocks—made at a Link-Belt plant devoted exclusively to these precision products. For Book 2550 on the full line—ask one of the 40 Link-Belt offices or any authorized stock-carrying distributor.

**LINK-BELT**

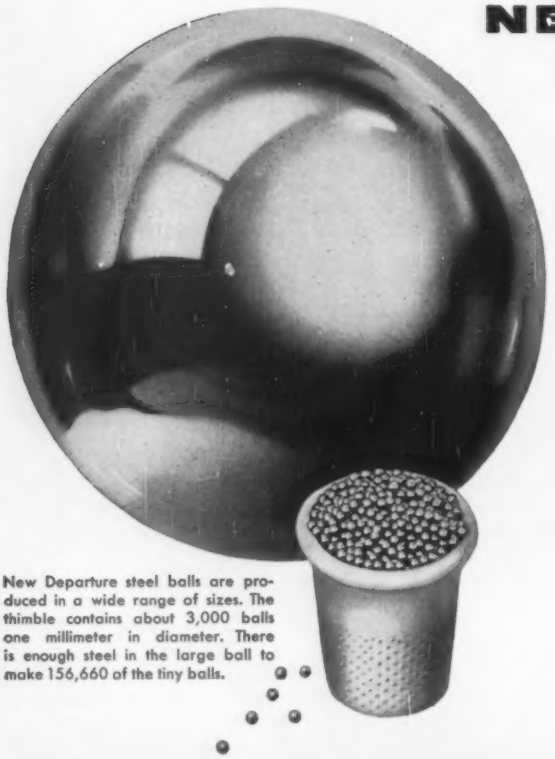
**Ball and Roller Bearings**

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13.990

# FACTS

about

## NEW DEPARTURE STEEL BALLS



New Departure steel balls are produced in a wide range of sizes. The thimble contains about 3,000 balls one millimeter in diameter. There is enough steel in the large ball to make 156,660 of the tiny balls.

### Available in any quantity to fit your specifications for grade, size and accuracy!

When industry wants steel balls of proven accuracy and dependability, it is only natural that they turn to New Departure, leading producer of ball bearings and therefore thoroughly experienced in the manufacture of precision balls. Today, New Departure provides industry with high-carbon chrome and stainless steel balls in a wide range of sizes and specifications.

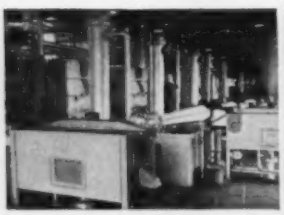
New Departure balls are produced from the finest high-carbon chrome steel. AISI Type E51100 steel, specially made for New Departure, is heat-treated to achieve the proper hardness and toughness for maximum strength and life in the finished product. Stainless steel, AISI Type 440C, used by New Departure results in balls of much improved hardness and load-carrying ability.

In addition to producing the finest steel balls available, New Departure will fill volume orders for balls of special materials such as high-nickel or cobalt-base alloys, tool steel and others.

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

Steel ball wire is drawn through dies to assure uniform diameter and roundness.

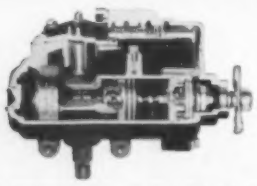
Precise control of grain flow is obtained with these Ball Heading Machines.



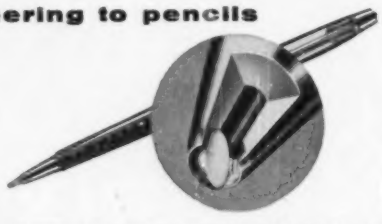
Balls are heat-treated, quenched in oil or water, then tempered in electric furnaces.

These gauges sort balls into lots according to required diameter limits.

### Applications range from power steering to pencils



The unique advantages of New Departure steel balls are utilized in many applications ranging from heavy-duty bearings to the new liquid lead pencil. To accommodate these applications, New Departure steel balls are offered in sizes ranging from .025 inch to 1⅞ inches in diameter.



# NEWSFRONT

### Frying-Pan-or-Fire Choice

Rumblings from a Senate Antitrust sub-committee that General Motors should cut prices in view of high earnings are aggravating ulcers among the independents. GM's a bit baffled too, says one GM official. Another Congressional committee stands by ready to brand any such action as an attempt to squeeze out competition.

### Tool Steel for High-Heat Fasteners

Fabricating fasteners from high-grade tool steel stock has lengthened fastener service life from a matter of hours to months. Previous stainless fasteners for service at about 1200°F failed in 6 to 8 hours. The steel producer decided tool steel might work out; had an outside firm take on the tricky problem of producing the large size bolts. First set is reported still in service.

### Home Construction Outlook's Strong

At least 1.2 million new homes this year, expectations of another near-record season. That's what top government money managers and construction officials anticipate for '56. Despite continually rising mortgage-money interest rates, they think enough credit will be available, at steady rates, for at least that many starts—and more if credit eases.

### Now Supersonic Spindle Speeds

You can step your machine spindles up to as high as half-a-million rpm speeds with newly developed contact roll bearings. With them, standard 3600 rpm electric motors can spin workpieces at 70,000 rpm—take greater advantage of the potential in modern cutting tools. Bearings require no special lubricants. Their promise: shorter cutting time, better surface finishes, higher productivity.

### Behind the "Higher Price" Hubbub

There's not apt to be any letup in steelmakers' agitation for higher prices for some time. Don't look for it. The industry's determined to get away from a defensive position on price increases. Past silence, says one steel company head, only invited criticism, invoked atmosphere of fear among steelmakers.

### Tractor Transmissions Going Automatic?

Farmers will be offered automatic transmissions on tractors soon. At least one maker hopes to have its new transmission perfected in time for introduction in 1957.

### TV Stands Firewatch Duty

Cadillac's Cleveland Tank Plant is being protected against fires by two weatherproofed TV cameras. Each watches over half of the huge roof. Controls, screens are centralized in plant protection offices. Company says the 24-hour TV system permits one man to scan entire 29-acre roof area in a matter of seconds.

### For Super Speeds: More Stainless

Fifty pct or more stainless—that's the outlook for tomorrow's supersonic aircraft, says one major steel producer. Reasons are high heat strength, corrosion resistance, ability to hold smooth surface finish, minimizing skin friction at 1500 mph speeds. Rockets, says company, are another cinch bet for stainless.

### Truckers Test Moly-Sulfide Additive

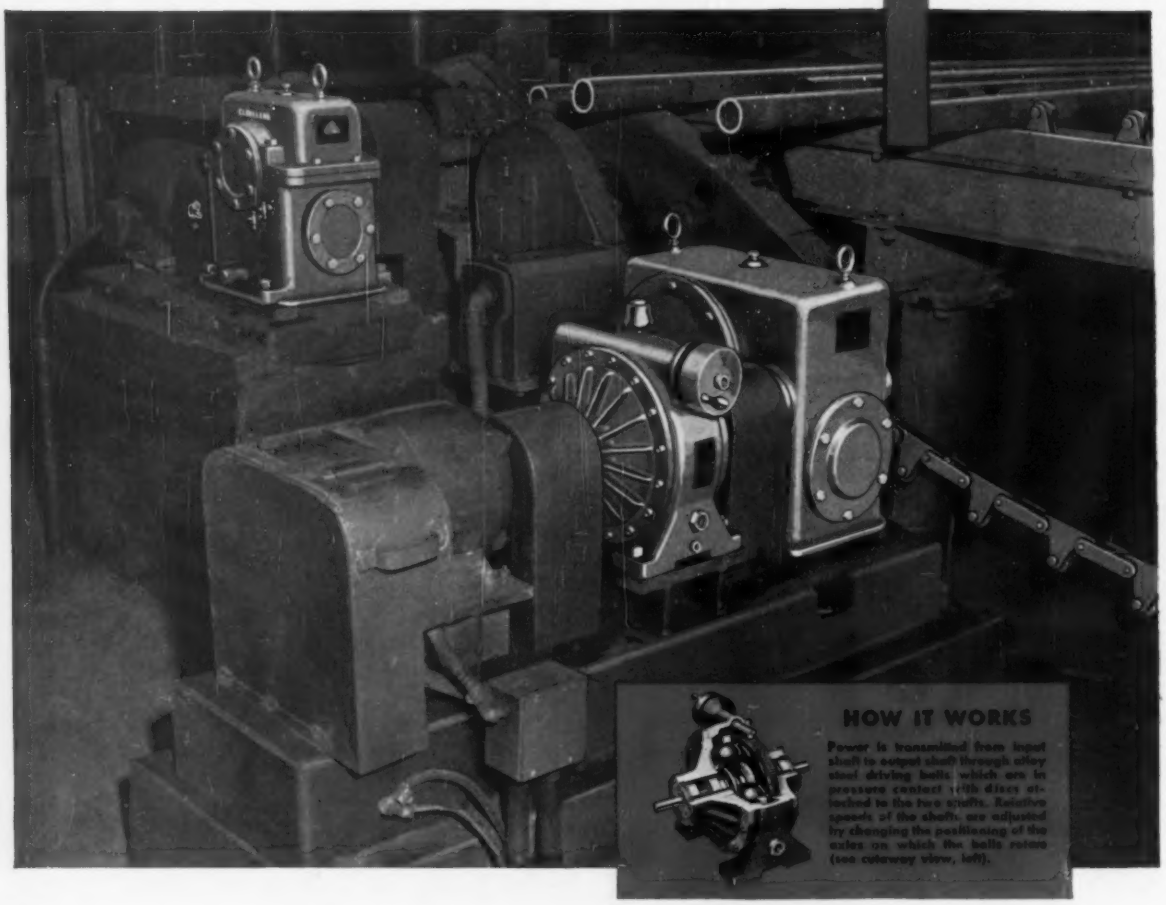
Automotive chassis grease may be a fat potential market for Moly-Sulfide additive. Tests by one major trucking firm show its use has extended normal lubrication period 300 pct; greatly reduced wear on critical chassis parts. The material forms a film on metal surfaces which acts as a lubricant when the oil or grease film is removed by shock loads or wiping action.

### Cathodic Protection Push Due

Look for zinc producers to start a big push soon on cathodic protection. A job in Liberia will use 250 tons, one in Boston is proposed in the 400-ton range. Also watch for test results on anodized zinc diecastings, which may recover some applications lost to anodized aluminum.

# Hot pipe conveyor travels at precision pace set by CLEVELAND Speed Variator

Drag-type conveyors utilizing Cleveland Speed Variator Size 6K4 Series 1. Driving Cleveland Double Reduction Worm Gear Size 051D Series F, ratio 900:1.


HOW IT WORKS
Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts. Relative speeds of the shafts are adjusted by changing the positioning of the axles on which the balls rotate (see cutaway view, left).

THIS hot pipe conveyor produced by York-Gillespie Mfg. Co. is a good example of the precision engineering applied in steel mill operation today. Conveyor speed has to coincide exactly with the speed of other operations on the line—has to adjust to the pace of production anywhere in the line. That's why a Cleveland Speed Variator is on the job!

Being infinitely variable, the Speed Variator gives stepless speeds over its full 9:1 range—from ⅓ to 3 times input speed. Output speed is adjusted manually by a hand wheel mounted on the Variator—but could be regulated automatically by remote controls of various types.

The Cleveland Speed Variator provides these major advantages: 1. An extremely compact unit with input and output shafts in line and rotating in the same direction; 2. Almost any input speed up to 1800 rpm can be used—either clockwise or counterclockwise rotation; 3. Rated for constant horsepower output over a 9:1 range, or for constant output torque with a 6:1 range; 4. Infinitely variable over the entire speed range; 5. Rapid response to speed change, precise adjustment, and accurate maintenance of speed settings; 6. Long life and minimum maintenance due to absence of belts or complicated linkages; 7. Ample bearing support for overhung pulleys on either input or output shafts.

This revolutionary variable speed drive is available in eighteen standard types and sizes. For detailed description of the Cleveland Speed Variator with photographs, sectional drawings, rating tables and specifications, write for Bulletin K-200.

## THE CLEVELAND WORM AND GEAR COMPANY

Speed Variator Division, 3282 East 80th St., Cleveland 4, Ohio

*Sales representatives in all major industrial markets. In Canada—Peacock Brothers Limited.*

# Vacations Pose Problems for Industry

**Whether to shut down or operate is perennial problem for industry as vacation time rolls around . . . Trend is apparent toward plantwide layoff as opposed to staggered plan . . . Survey detects more liberal policy.**

◆ WHEN VACATION time rolls around, industry comes up against the perennial problem: shut down or operate? The answer hinges on a number of factors, including order backlogs and need for maintenance.

Oddly enough, some companies with fat order books are planning shutdowns rather than limp along with reduced forces over a longer period. Others in the same circumstances are staggering vacations. Both apparently feel they'll wind up ahead from a production standpoint.

If there's a trend in industry, it seems to be toward the complete plant shutdown. Industry also is moving toward a more liberal vacation policy, partly traceable to the pressure of organized labor.

There are several good reasons for the plant shutdown: (1) it provides an opportunity for major maintenance, (2) it gets the vacation problem out of the way in a hurry, and (3) it eliminates the headache of trying to maintain production with key men absent.

### More Liberal Trend

With steel supply tight as it is, most companies planning shutdowns are making arrangements to take in steel shipments. Possibility of a steel strike may have some influence on metalworking companies scheduling plant shutdowns and many may hold off until last minute to gauge strike possibility.

Overall, plantwide vacations appear most practical in manufacturing industries, says the Bureau of Labor Statistics. Service industries like steel warehouses find plant closings least feasible, while seasonal industries find them almost ideal.

In an all-industry survey of 225 companies on 1956 vacation plans, The Dartnell Corp., Chicago management consultant firm, learned that 16 pct are changing plans from last year—all toward a more liberal policy. Generally, firms are lowering minimum requirements for two-week vacations, and extra time is being added to top seniority allowances. Some firms are adding an extra week, and the trend is to less time to qualify for the longer vacation period.

Maintenance departments of most metalworking plants are looking forward to vacation periods for a chance to overhaul sorely overworked machinery. Much of it has been operating steadily since last year.

### Foundries Favor Shutdown

Steel companies generally follow a policy of encouraging workers to take time off rather than work and take the extra pay. Steel union leaders feel the same way. But there are exceptions. At least two major mills in the Pittsburgh

Typical 1956 Vacation Policies
(136 Companies)

| Length of Service | Hourly Workers: Companies | Hourly Workers: Weeks | Salaried Workers: Companies | Salaried Workers: Weeks |
|---|---|---|---|---|
| 6 Months | 18 | 1 | 35 | 1 |
| 1 Year | 88 | 1 | 54 | 1 |
| | 42 | 2 | 87 | 2 |
| 2 Years | 20 | 2 | 18 | 2 |
| 3 Years | 15 | 2 | 12 | 2 |
| 5 Years | 40 | 2 | 24 | 2 |
| | 6 | 3 | 6 | 3 |
| 10 Years | 12 | 3 | 12 | 3 |
| 15 Years | 65 | 3 | 65 | 3 |
| 25 Years (or before) | 22 | 4 | 18 | 4 |

area are offering men the option of taking vacation pay instead of time off. One company has already held a "vacation payday."

In the foundry field, the trend definitely is toward plant shutdowns. Probably half of all U. S. foundries now schedule complete shutdowns, generally for two weeks, compared to about 10 pct immediately following World War II.

The Gray Iron Founders Society in Cleveland says the trend toward shutdowns is growing because it is a convenient way to handle the vacation problem. In most cases, complete maintenance crews, augmented by regular foundry workers who want the extra money, take over relining cupolas, overhauling machinery, and other needed repair work. Foundry crews are generally canvassed to determine who wants to work during the shutdown and selections are based on seniority.

**Auto Policy**

The Valve Div. of Thompson Products Co. will soon start an inventory build-up to tide it over the plant shutdown period. These parts are shipped in advance to warehouses and trucking firms. The company's automotive customers order directly from these storage depots during the vacation period.

Of the Big Three auto companies, Ford is the only one that insists its factory workers take vacations. Chrysler and General Motors give the worker a choice. All three encourage their people to take vacations during downtime for model changes.

The growing number of three-week vacation workers is becoming a problem for industry. One foundry in Pittsburgh will close for two weeks in July and "limp along for the rest of the month" as the third week of vacations is cleared up. An equipment maker has three-week men take their extra time in the form of long weekends, outside the regular vacation months.

**Trend In Ohio**

Mill equipment makers for the most part are planning to work through the summer, staggering vacations.

In general, Aluminum Co. of America plants will stagger vacations through the summer. In foil and a few other operations, men are being asked to work six days to keep up with demand.

Westinghouse Electric Corp. ordinarily closes its mass production plants—mainly consumer appliances—for two weeks. This year, Westinghouse has offered these plants the option of taking pay or vacation for one of these weeks. The company's heavy equipment plants will operate through the summer, with vacations rotated.

Rockwell Manufacturing Co. will have 90 pct of its production workers out for two weeks in July. Pittsburgh Screw & Bolt Co., and Mine Safety Appliances are also shutting down for a two-week period.

The trend toward plant shutdowns appears to be more pronounced in the northeastern Ohio area, where last year some 170 companies employing nearly 70,000 workers scheduled total shutdowns compared with 95 companies employing over 25,000 favoring the staggered-holiday plan. Most favored shutdown period companywise was the first week in July, but most workers were off during the fourth week of July.

**▪ For last-minute news of industry, see "Metalworking Briefs" column on page 176.**

Oftentimes, unions will use their influence on the side of one or the other vacation system. In the Chicago area, one company switched this year from a full plant shutdown to a staggered vacation, at union behest. Now the union is not so sure it did the right thing. Rank-and-file members are complaining because top seniority workers are getting the choice vacation periods. Previously, everybody was sure to have an August vacation.

Regardless of the system used, industry has learned to gear itself to the "great American vacation." It knows that the problem is likely to grow more complex with increasing pressure for more leisure.

## What's The Trend In Vacations Policy?

**▪ In a survey of vacation policies, The Employers' Assn. of Chicago last year canvassed 251 offices and 246 plants employing approximately 168,500 employees.**

**▪ Sixty-eight per cent of the companies surveyed grant three week vacations. Three week vacations are granted to plant employees by 158 companies and to office employees by 167 companies.**

**▪ Ninety-seven companies shut down their plants for the vacation period. Of these plants, 57 closed in the week beginning July 4, 1955.**

**▪ Fifty companies sponsored picnics for their employees. Of these, 40 companies paid all expenses; four shared the cost with employees. One company joined with the union to sponsor the picnic. The balance shared the cost with the company service club.**

*Reprints: Individual reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The Iron Age, Chestnut & 56th Sts., Philadelphia 39, Pa.*

# STEEL: Prices Are a Touchy Subject

**Steel leaders disagree on whether prices should be raised before wage settlement . . . Customer inventories are another bone of contention . . . But there's no argument on earnings and outlook—*By J. B. Delaney.***

◆ WHEN STEEL men disagree, they spare no punches. At quarterly meeting press conferences, steel leaders voiced varying opinions on (1) the need for immediate price increases, and (2) whether steel consumers are building inventories.

Everybody agreed that earnings are good and that steel operating rates will be high for balance of the year. There will be a dip in third quarter, but this will be due as much to vacation and hot weather slowdowns as to any expected lack of business.

The price pot boiled over when Roger M. Blough, chairman of U.S. Steel Corp., said his company "contemplates no general price boost at this time." This was not to the liking of Ernest T. Weir, chairman of National Steel Corp., who said as much the following day. Mr. Weir and other steel company heads have been pitching for higher prices now as an offset to higher operating and material costs and to help finance expansion.

### Customer Inventories

"It's a little easier for United States Steel to increase output without raising prices because of their size," said Mr. Weir. "But so far, we've found no plan except greater earnings that would make it possible for us to expand our capacity. We have had a sort of historical method (of changing the price of steel) in the industry. Now it may be time for a change."

Eugene G. Grace, chairman of Bethlehem Steel Corp., seemed to side with Mr. Blough on the question of price advances now or after settlement of steel labor negotiations. "We can hold our horses" until after the labor settlement, was the way Mr. Grace put it.

Mr. Grace stood virtually alone in his appraisal of the market from the standpoint of inventory building by consumers. Mr. Blough, Mr. Weir, and others said there is evidence of stock building. Customer inventories are rising at a "very rapid rate," said Mr. Blough. Mr. Grace has other ideas:

"There's a desire to build inventories, but the users can't get the steel. We know our steel is going into immediate production. Maybe U. S. Steel is experiencing something we're not. I'm speaking for Bethlehem."

### Labor Outlook

Several steel companies took a slap at the high price of scrap. These included Alan Wood Steel Co., Crucible, Copperweld, National, and U. S. Steel. "The demand for steel-making scrap has raised the price of prime grades above the price of pig iron and the nickel content of nickel bearing scrap is currently more than twice the price of virgin nickel," said William P. Snyder, Jr., chairman of Crucible. Mr. Blough pointed to heavy scrap exports and the record price of top melting grades.

Everyone was cautious about the outlook for labor peace. Most expressed belief—and hope—that an agreement could be arrived at amicably, although Mr. Blough described the "package" that steel labor supposedly is planning to ask for as "prohibitively high," particularly the expected demand for weekend premium pay.

### Backlogs Heavy

C. L. Austin, president of Jones & Laughlin Steel Corp., raised some eyebrows when he told stockholders that his company is making a "serious" study of an early entrance into stainless steel.

"For many years," said Mr. Austin, "we have considered the eventual manufacture of stainless steel products. With the completion of the present construction program, we will have many of the components necessary or desirable for manufacturing these products. While no final decision has been reached, I believe you will be interested to know that serious study is now being made of our early entrance into this active and progressive field."

An idea of incoming business volume in first quarter was given by Mr. Blough, who said U. S. Steel backlogs were 7.5 million tons as of March 31 compared with 6.7 million three months earlier and 6.3 million one year ago.

First quarter earnings of most companies were at record or near-record heights. U. S. Steel reported net income of $104.2 million, a return of 9.5 pct on sales of $1,100.5 million, compared with $72.7 million, or 8.3 pct on sales of $873.3 million, last year.

(See Editorial, "Well Now That's More Like It," p. 7.)

## Steel Company Earnings

| | First Quarter 1956 | First Quarter 1955 |
|---|---|---|
| U. S. Steel | $104,200,000 | $72,700,000 |
| Bethlehem | 44,963,787 | 35,313,262 |
| Republic | 25,041,392 | 18,192,265 |
| Jones & Laughlin | 13,559,000 | 9,642,000 |
| National Steel | 14,100,000 | 11,200,000 |
| Youngstown Sheet & Tube | 10,193,856 | 7,975,488 |
| Inland Steel | 14,015,549 | 10,432,755 |
| Colorado Fuel & Iron | 4,016,414 | 2,929,894 |
| Wheeling | 5,280,000 | 2,892,000 |
| Crucible | 3,680,966 | 2,248,896 |
| Pittsburgh Steel | 2,469,624 | 909,741 |
| Granite City | 3,779,801 | 2,261,104 |
| McLouth | 2,439,077 | 993,255 |
| Barium | 1,468,957 | *471,595* |
| Allegheny Ludlum | 4,572,608 | 2,410,906 |
| Lukens | 1,361,641 | 292,384 |
| Detroit Steel | 2,178,832 | 1,015,035 |
| Alan Wood | 689,172 | 269,397 |
| Copperweld | 971,898 | 624,684 |
| Rotary Electric Steel | 613,220 | 825,459 |
| Continental | 726,643 | 699,805 |
| Acme Steel | 1,863,144 | 1,541,723 |
| Washington Steel | 447,999 | 469,430 |

*Italics indicate loss.*

MANUFACTURING

# COLOR: New Headaches for Finishers

**Demand for household goods in color is up . . . But fabricators find it must be the "right" color or no sales . . . Compatible colors possible solution . . . Drifting continuous problem.—By *F. J. Starin.***

◆ THE TREND to color in appliances and other consumer products has dished up a batch of headaches for metal finishers.

Manufacturers are learning that color alone is not enough for the American consumer. It must be just the "right" color. And it takes little imagination to visualize the problems this brings up.

How far advanced is the trend? General Electric reports that 18 pct of its appliances are in color. On some production lines, colored items run as high as 30 pct of the total.

This adds up to considerable tonnages. Porcelain Enamel Institute reports that its members expect to sell over $218 million of porcelain enamel for household appliances in 1956, up $8 million over 1955. And this does not include cooking utensils or hospital equipment (the patients like it!) which will account for sales of about $30 million.

Finding the proper colors thus far has not been easy for industry. First approach was an attempt to arrive at a system of color standardization. The Institute of Appliance Manufacturers set up a color standardization committee under chairmanship of John R. McCord of Ferro Corp., Cleveland, as a clearing house on color problems.

### Matching

The group had some success. According to reports, Caloric's newest pink matches General Electric's; and its green is closely akin to the Frigidaire green. Gibson's pink, yellow, and green match comparable hues in the Frigidaire line.

But generally speaking, manufacturers have resisted standardization, with the aim of promoting their own distinctive color line.

Westinghouse, for instance, is selling "confection colors" designed by Melanie Kahane, featuring mint aqua, frosting pink, lemon yellow and nougat gray. Republic Steel Kitchens has a similar line called "harmony hues," featuring tempo turquoise, large yellow and prelude pink.

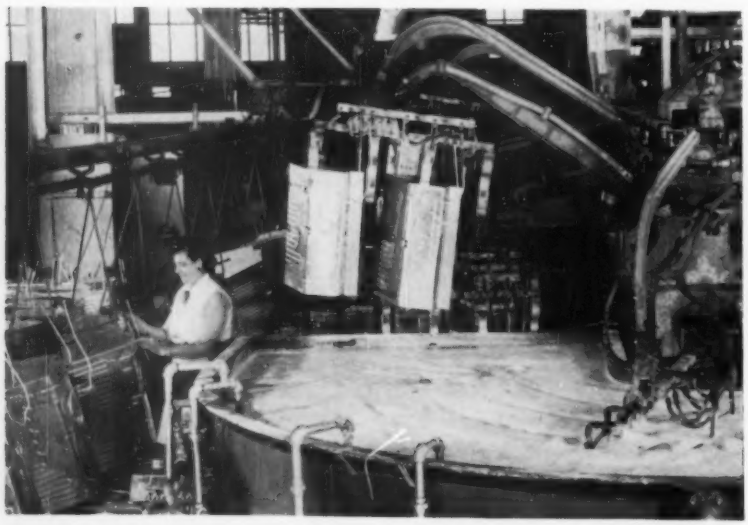
Westinghouse has gone one step further with its "Choose-N-Change." A colored heavy gage vinyl panel is set into the outside top portion of refrigerators. There are 10 colors available, and panels can be changed at a cost of $10.

At a recent meeting of the Extruders Council, a new process was announced which is applicable for promoting sales to consumers whose decor is traditional, or features extensive wood paneling. A combination of photography and enameling can be used to produce marble or wood grain effects.

### Right Color

A solution to the match-or-contrast problem has been suggested by color and design engineer Howard Ketcham. Mr. Ketcham believes the coming thing is compatible color. He is selecting colors for a line of porcelainized bathroom fixtures for Briggs Manufacturing Co. designed to blend with the maximum number of other colors. Bates stapling machines are sporting new compatible color scheme selected by Mr. Ketcham.

Another problem facing the industry is the selection of proper colors for a specific market. It is inefficient, and during time of capacity production, impossible, for fabricators to turn out a wide range of colors. And besides, jobbers object to the large inventories this requires.



**LINE for color anodizing aluminum at Reynolds Metals is kept constantly active turning out mill products in increasing range of hues, as well as special shapes and parts for a growing independent fabricator market.**

**MAJOR range maker has all sections visually as well as automatically checked to reduce drifting problem.**

A manufacturing problem which can have major repercussions at the retail sales level is one of maintaining standards during production so that separate batches will not differ in shade. This difference is called color "drifting," and is solved in a number of ways. The Porcelain Enamel Institute reports that many of its members are using an instrument called the Colorimeter. The device takes a reading of a color and assigns a number according to the tone values. By comparing a test strip with a standard color plaque a close check can be kept on a run to prevent drifting.

One major appliance manufacturer, utilizing a porcelain enamel finish, checks the color at four different stages of the enameling process, at each mill and storage tank just prior to the run, and daily at each spraying booth.

Automation devices for cleaning, handling and spraying help minimize the margin or error.

### Aluminum Markets

While steel porcelain enameled is the older of the color finished materials, aluminum, both porcelain enameled and anodized, is definitely in the scramble for an increased share of the consumer dollar.

Aluminum Co. of America has developed a process it calls R-100 for the continuous enameling of aluminum. The company claims it reduces cost by eliminating multiple chemical baths and prefiring operations. Alcoa also sells a line of color anodized mill products, sheet, tubes, extruded shapes and fasteners.

Reynolds Metals is engaged in an intense color anodizing research project aimed at perfecting colors and production methods. Kaiser has come up with a method of producing a gold colored aluminum without the use of dyes. The aluminum is combined with certain alloys and anodized under controlled conditions.

Because of the structural differences the use of aluminum seems to be more restricted than porcelain enameled steel in most heavy appliance applications. However, there are some consumer product markets in which the differences work in aluminum's favor.

A new process developed by Engineering Products and Specialties, Inc., Pawtucket, R. I., is helping aluminum in the tubular furniture field. With the new method pieces may be colored before fabrication. Orders can be processed more rapidly with smaller and more compact inventories.

**MERRY GO ROUND spins, and overhanging rubber arms scrape excess enamel from automatic washer top in color finishing operation.**

Aluminum's traditional light weight is teaming up well with the new anodized color to build sales of smaller consumer goods such as cooking utensils, kitchen containers, ice cube trays, and trim. John Torrison, president of Aluminum Specialty Co., Manitowoc, Wis., making a line of 13 such items, insists that increased use of color is "the greatest change in the American home." Mr. Torrison foresees demand increasing to such an extent that there will be shortages of color anodized aluminum.

### Wider and Wider

A good barometer for the acceptance of color is the number of new, sometimes unexpected fields adopting it.

Kawneer Co., Niles, Mich., makes a colored door through use of a vinyl-bonded-to-aluminum material developed by U. S. Rubber Co.

Ferro Corp., Cleveland has developed a process for coating .005 in. aluminum with porcelain enamel either on both sides or one side. The resulting product, flat, embossed or corrugated, can be cut with household scissors.

Vikon Tile Corp., Washington, N. J., turns out a similar product with a technique developed by Du Pont de Nemours & Co., Inc., in 15 different colors.

Pemco Corp. makes a copper colored porcelain finish used by a number of major built-in and free-standing range and stove fabricators.

San Francisco General Hospital surveyed patients for preferences in color in a move to replace "cold white" with softer, relaxing, more home-like equipment and decor.

Anchor Precision Corp., Westbury, N. Y., has introduced a colored zipper made by fusing a colored plastic finish to the metal.

Gilmore & Nolan, Inc., Los Angeles, is selling a line of metallic paint in blue, green and gold.

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PRODUCTION

# OIL COUNTRY: It Needs the Goods

**Tubing and casing are getting tighter . . . Steel companies cut allotments to drillers . . . Mills are doing their best to ease situation, but prospect of record drilling makes it tough—By *K. W. Bennett.***

◆ ALMOST ECLIPSED by the long term demand of the oil and gas industry for linepipe is the increasingly critical shortage of oil country goods—tubing and casing for the men who drill the wells that fill the pipelines.

Last week as third quarter mill allotments began to trickle back to hard pressed steel buyers in the oil industry, it became apparent that third quarter tonnages of tubing and casing will be lower, per individual customer, than the already squeezed allotments the mills were able to ship during second quarter.

OIL DRILLERS likes these are handicapped by shortages of tubing and casing. (Pure Oil photo.)

Estimates of the drop in incoming tonnage range per customer to as much as 25 pct. At mid-April drillers had completed about 3 pct more wells this year than they had in the same period one year ago, or a difference of 409 wells. Based on 1955 drilling figures, this means an additional 14.2 tons of steel per 1000 ft of hole drilled, or a total of at least 232,312 additional tons of steel required.

In theory, this has been more than made up by the 30 pct advance in shipments of oil country goods by the steel mills during the first two months of 1956, as compared with last year. But the shortage grows worse. For one thing, the in-transit tubing stocks, a kind of a mill depot for storage of tubing and casing, were depleted in early 1955. They supplied good tonnages of steel to sustain the advancing drilling rate, but now these are gone.

### Reasons Why

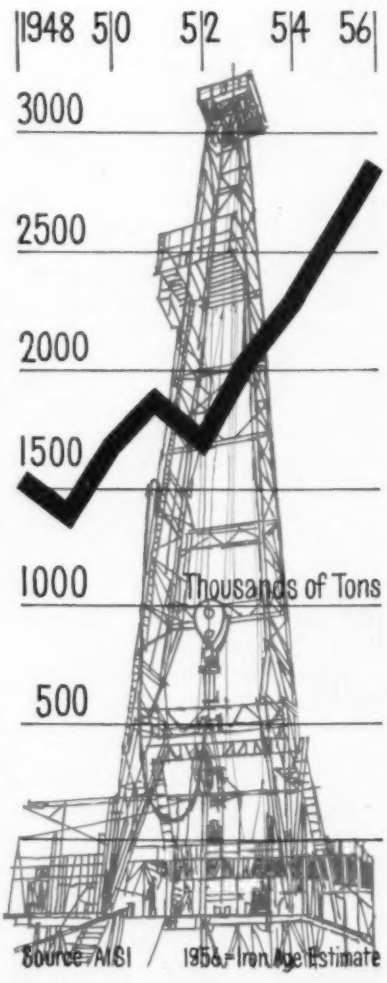
For another, the reserves of tubing and casing often held by the mills are gone as well. There is nothing on the ground. For a third explanation for these casing and tubing buyers who seem to be starving in the midst of a plentiful mill output of tube and casing, there is the extreme lack of inventory out in the field at the drilling sites.

There've been reports of drilling companies with 6-8 months inventory of tubing and casing. Close inspection indicates a high percentage of the proverbial "dogs" in this tonnage—steel in off sizes and of types not often specified in the heavy drilling programs. The actual operating inventory boils down to about 90 days and in the words of a steel buyer for a large drilling concern, "anybody who has 90 days inventory in hand is a mighty lucky boy."

### Mills Do Best

Besides grinding out casing and tubing at an unprecedented rate, mills have reduced quotas, have reduced bookings by dropping as much as a month or more from first quarter's bookings and the same from second quarter, and have even set up a new system of quarters running one month later

**Oil Country Goods Shipments Keep Climbing**



than the regular calendar quota in one case. It's been an aid, but not enough. Buttweld tubing for instance, is reportedly available on 3-4 week delivery. One buyer contends that he couldn't get a sufficient tonnage to handle his needs before July.

One year ago, the buyer could get electricweld casing when he couldn't get seamless. This year there is no difference. The minimum carryover reported from the field was 4 to 6 weeks. Some buyers have material still undelivered that was originally scheduled for early first quarter delivery. Oil field is literally a runaway market.

### Foreign Steel

Foreign steel is no help. Japanese mills are reportedly already into first quarter 1957. Italian tube is coming in but the buyer complains that he won't have it when he needs it the most. Neither is conversion an out. Conversion of billets for tubing and casing was one of the longest lived conversion markets of the Korean period. A buyer reported last week that he'd given up locating either mill space or ingot in sufficient quantity to really be of help.

Drilling is up. Refinery building is up. Pipeline construction is up. Construction of field processing plants and storage plants is up. In a word, it's a very good year for selling metal to the oil, gas, and petrochemical industries. If you have anything left to sell.

## Giant Press

Metal processing Div., Curtiss-Wright Corp., Buffalo, has started production on a new 12,000 ton horizontal extrusion press.

The equipment is reputed to be the only press in the U. S. Air Force's big press program for the extrusion of steels and large titanium components.

As an example of the conservation of strategic materials made possible by the new unit, Roy Hurley, president of Curtiss-Wright pointed out that a certain alloy steel aircraft engine part required a billet weighing only 35 lb on the new press. With older less formidable machines a 78 lb billet is required.

MARKETING

# PIPE: School for Salesmen

**Republic develops sales course for distributors of pipe products . . . Response is heavy . . . Aim is better educated distributors for final better customer service.**

◆ STEEL SALESMEN these days are growing used to pressure from consumers for more steel. But at Republic Steel in Cleveland the salesmen are trying to calm down pipe distributors anxious to go to school.

In a series of one-day distributor meetings in the last few weeks in Tulsa, Birmingham and Cleveland, Republic has launched a new $750,000 program, unprecedented in the industry, for better educating distributor salesmen, most of whom have never been in a steel mill.

Response has been so heavy already that Republic estimates 7500 salesmen will get "Order Makers Institute" certificates by this December. The clamor is coming from distributors pressuring Republic to get their company first on the list for the sessions. And plans are already afoot for expanding the program into fasteners, stainless and alloys, steel kitchens and building materials.

### How It Started

The idea was hatched two years ago during the bottom of the steel inventory readjustment when Republic, like other producers, was operating at far under capacity. Pipe plants were slowed to a walk; more capacity was being installed and still more on the way. In two years it would represent 1/7 of all tonnage for the company, third largest in the industry.

Most of the distributors who handled it had come up through the ranks from warehouse helpers, clerks and inside salesmen and few had ever been in a steel mill. To them, pipe was pipe. There were 400 merchant pipe distributors and 25 oil country goods houses. Republic's top salesmen, Vice President Norman S. Foy and General Sales Manager L. S. Hamaker, reasoned the distributors would jump at the chance to learn more, would probably sell more and could better service the plumbing contractors, hardware men, utilities and petroleum refiners and producers they dealt with. To make sure, an outside agency was hired to interview purchasing agents for these consumers for their reactions. The response convinced Republic it was on the right track. Setting up the new school was the next step.

### Modern Methods

Ten specially made movies were put together for customers and salesmen. These included coverage of quality, application and manufacture of pipe, including plastics, for both merchant and oil country types. Two are on how to deal with buyers and allocation of salesmen's time and will be used on both courses. Experienced company salesmen will be given intensive one week courses on how to conduct the classes and a host of the latest visual education devices will be used by each. One unusual aspect is that through this training, company salesmen's own faults may be pinpointed.

### Long Range View

Although pipe demand now is far ahead of supply, Republic is taking the long range view. With better educated distributors they feel their share of the available business will be increased on a diversified customer basis. In addition, the distributors, who are, in effect, Republic representatives to the ultimate customer, will be better able to advise customers on correct usage and application, thus providing a better service to the customer. Eventually, it should mean more pipe sales for Republic.

EDUCATION

# SCIENTISTS: They're Made, Not Born

**Industry is looking to high schools to help solve shortage of engineers and scientists . . . Soviet educational advances prompt need to bolster U. S. education . . . G. E., U. S. Steel show how it's done.**

◆ THE NATION's shortage of scientific and engineering talent will be around for a long time to come.

Forward-looking management, including a growing segment in metalworking, is coming to realize the long-range problem has a better chance of solution if it's faced in its early stages—when the youthful potential engineer is still in high school.

Behind these efforts is the need to shore up dwindling pools of technically-trained manpower, coupled with a deep concern over reports that Russia is steadily expanding its reservoir of young scientists and engineers.

### Some Encouragement

Working along democratic lines, U. S. industry has already met with some success in encouraging pre-college students to follow science and scientific and engineering careers.

Both General Electric Co. and U. S. Steel Corp. are setting examples of how the problem can be approached.

GE's Educational Relations Dept. for a number of years has been supplying informational pamphlets, booklets, brochures, slides, and films to public school teachers at both the junior and senior high school level.

These help stimulate student thinking along such lines as: "Why Study Math?" "Why Study Science?" and "Why look into Engineering?" The series has already been distributed to the tune of over 2 million copies and requests are still pouring in.

Following a company analysis of a cross section of the U. S. high schools which revealed student weaknesses in mathematics, GE came up with a companion booklet, "Math At General Electric." This provides teachers with examples of how mathematics is used in a variety of jobs in the company.

Teachers indicate the series has already had noticeable influence in selling mathematics as an essential rather than a marginal subject in high school.

Going a step beyond students themselves, the company has a long-range program geared to keeping teachers up-to-date in math and science subject matter. This summer, there will be five such seminars open, run for graduate credit by five colleges. Three of these will be in physics and chemistry, two in mathematics.

The company feels, first, that these provide a needed refresher in subject matter for teachers who have not had an opportunity to keep abreast in new subject developments since graduating from college. Secondly, the teachers have an opportunity, through visits to nearby GE plants, to see the practical applications of the subjects they teach.

### Other Projects

In addition, GE makes available to employees and their children some assigned scholarships in selected fields to senior year students who have made a distinguished scholastic record during their junior year.

U. S. Steel is working with the national engineering societies, other industries, and school authorities in a variety of programs aimed at encouraging promising students along technological lines. The company promotes science fairs, or expositions, which are frequently staged by industrial and educational groups in many cities. Well known is the annual fair conducted by Pittsburgh's Buhl Planetarium for high school students and their counselors.

In addition, staff engineers do-

## "Crash" Program for Scientists

◆ CONGRESS has been warned by an expert on scientific manpower that it had better legislate a "crash" program to get more scientists and engineers trained — and trained quickly.

Dr. Howard Meyerhoff, of the Scientific Manpower Commission, is advising members of the Senate-House Atomic Energy Committee that the Communists are channeling "thousands" of their most talented youths into advanced technical training.

To illustrate the U. S. shortage of scientific personnel, Dr. Meyerhoff points out that U. S. institutions of learning turned out 23,000 scientists last June. The total demand was for 40,000 scientists. This year, he predicts, the spread will be still greater. Competition among employers for graduates will be keen.

Actually, the number of scientists being graduated each year has been rising, but the total demand from industry and government projects (such as the atomic energy program) is rising faster.

nate their time to the work of student guidance committees sponsored by leading engineering societies. An example of this is the recently held 3-day student counseling session at Pittsburgh's Mellon Institute, under the direction of a professional staff engineer.

### Reason for Concern

It's easy to understand why industry is concerned over helping education at the high school level. A recent statement by educators and scientists shows that approximately 50 pct of U. S. high schools offer only physics or chemistry courses, but not both, and some 25 pct have dropped both subjects entirely.

Many authorities say the problem is a general lack of stimulating high school science teaching. This is caused in part by low pay scales and the steady siphoning of top grade science teachers to industry.

Upgrading of teacher salaries will help in the short range goal of making the job more attractive to qualified college students. For the long-range pull, however, many businessmen and educators feel that more able high school graduates must get to college to develop the national total resources of scientific talent.

But it's obvious that before secondary institutions can turn out finished engineers, they must have students with at least a start in technical education.

### Collective Force

Another reason for concern is the knowledge that Russia is using its collective force to rush an expanding engineering and scientific body. Former Senator William Benton points this out as a result of a study of Soviet education.

He points out that the Reds are "now challenging us frontally on what have historically been two of our strongest points, technology and mass education. The present rate of Russian educational advance is faster than our own. The gap in total performance is closing."

PRODUCTION

# TOOLING: Records in Sight

**Big programs in autos and appliances are expected to beat the 1953 record . . . Only 15 pct of business is from Defense projects . . . Small firm profits lag.**

◆ TOOL AND DIE manufacturers expect their dollar volume of shipments this year will equal or exceed the record volume of $750 million, set in 1953.

This forecast was disclosed in Washington at the annual meeting of trustees of the National Tool & Die Manufacturers Association. More than 1,000 shops were represented at the meeting.

Total shipments in 1955 were not far below the record level, the meeting learned. Value is estimated at $700 million. And second-half business this year should be good, following high production in the first half.

### Few Defense Orders

Only about 15 pct of the total business now on the books is defense orders, it was pointed out. Much of the current activity is related to tooling up for 1957 automobiles.

Albert Kay, director of manpower for the Defense Dept., told the tool and die men the government is competing with them for skilled apprentices. At present, the Defense Department is training about 10,000 apprentices, 1700 of which are tool and die makers or machinists.

The Defense Department itself employs thousands of skilled workers in its industrial-type military installations, Mr. Kay said. He stated that wages, benefits, and working conditions in these shops are generally in line with employment conditions in any non-government machine shop.

Other highlights of the Washington meeting:

Production for the automotive, electronic, electrical and business machines industries is going "particularly well."

Detroit shops are optimistic over prospects for good business throughout this year and into 1957.

Developmental work is gathering speed, says a Connecticut member who produces for the electronic computer industry.

Competition among makers of household appliances is creating a lot of new business as more frequent model changes come on the market.

### Small Firms Hurt

A sobering note was introduced into the meeting by Walter B. Stults, of the Senate Small Business Committee. Mr. Stults declared flatly that small concerns in the tool and die industry are not progressing as satisfactorily as larger firms. He cited these figures in support of his contention:

In the first three quarters of 1955, shops with total sales under $250,000 made only 1.2 pct profit per dollar of sales, after taxes. And this represented an increase from the 1954 figure of only 0.7 pct.

On the other hand, firms with sales of $1 million or more made 7.2 pct profit of sales. This is an increase from the 1954 rate of 6.5 pct.

## Plane Contracts

Big U. S. Air Force planemaking orders are occuring almost every day. Here are some of the latest:

$93 million to North American Aviation F-86 and F-100 jet fighters. $23 million to Douglas Aircraft for B-66 conversion work. And Lockheed is getting $15 million for pilot production of F-104B's and $4.5 million for B-50 servicing.

AUTOMATION

# MACHINERY: Slow Price Climb

**Makers of industrial machinery keep price increases down compared to labor costs . . . Differential believed a factor in continued high rate of buying of capital equipment.**

◆ MANUFACTURERS of machinery and equipment for U. S. industry have been able to hold their price levels in check to much slower advances than wage increases.

This is indicated in an analysis by the Machinery & Allied Products Institute of the long term relationship between prices of machinery and equipment and the average hourly wage

**Order Stimulus**

MAPI contends that this reduction has been "an important stimulus to postwar sales" to the maker of capital equipment.

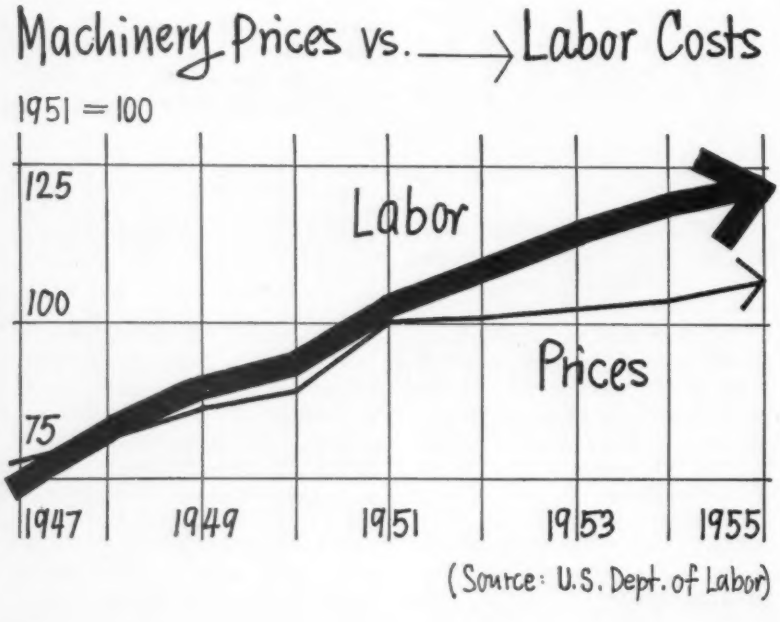
Cost conscious master mechanics and production engineers have been eager to recommend new equipment purchases to cut total manufacturing costs. MAPI believes that machinery industries must continue to show productivity gains in the future—"with the resulting stimulus to use of more efficient tools and equipment."

Using 1951 as 100 on MAPI's index for both prices and wages, wages in all machinery classifications have climbed to 125.1 in 1955 while total machinery prices rose to 111.3.

**How they Fared**

Biggest differential in specific classifications is in agriculture, where labor costs rose to 122.5 on the index compared with 105.1 for prices of agricultural machinery. About the same high differential was maintained in electrical machinery where the 1955 price index hit only 108 compared with wage index of 125.

In construction, wages reached 127.9 compared with machinery price index of 115.7; metalworking, prices 118 compared with wage index of 130.8.




(Source: U.S. Dept. of Labor)

## Machine Tools:

**Line automation new tooling development.**

Increasing emphasis on automatic machine tools has resulted in the growth of an entirely separate business—line automation.

Seven out of 10 machines that have been built in the last 2 years have been equipped with some kind of an automatic handling device. As the number of individual machines increased, automation naturally evolved to the next step —complete automation from blank to finished part.

When volume producers of small parts found that materials handling costs were going up, the demand for line automation also grew.

**What It Will Do**

The Michigan Tool Co. of Detroit reached the point where it established a separate automation division which is engaged in the design of completely automated lines, machine tool groupings and individual machines used in the production of gears.

Michigan Tool calls it Gear-O-Mation and here is how it works:

Suppose you are a volume manufacturer of gears and you have various types of individual machines for your operations. If you find that it is more economical to have a completely automated production line, the Gear-O-Mation Div. will do the job for you.

Basically, the company customizes standard machines with automatic loading devices and controls.

The division will add storage facilities if necessary; use gravity feeds where possible; install elevators if they are needed and also as many checking stations as necessary.

Building automation has opened up new fields for Michigan Tool. The company found that it has to build checking devices for inspecting parts as they move from one machine to another. It also has had to design gear washers to meet the speed required on an automatic line.

## Aluminum "Take" Dips

Government's requirements of aluminum for Defense Dept. and Atomic Energy Commission will drop by 8 million lb in the third quarter of this year.

Total in this period will be 142 million lb, or 14 pct of the total estimated supply. This includes amounts needed to meet requirements for "defense related" items, foil and ingot for powder, as well as direct military goods such as ships and planes.

The decrease, although slight, is good news to many small aluminum users who have complained of the hard time they are having getting enough metal for civilian production.

According to BDSA, the downtrend reflects primarily a change in Defense Dept. requirements during the period.

## Writeoffs:

### Freight cars receive tax amortization

The government approved fast tax amortization for 59,000 freight cars that were either under construction or on order books as of Dec. 31, 1955, the date the fast write-off program for railway freight cars came to an end.

The Office of Defense Mobilization, in announcing approval of fast write-off for the extra 59,000 cars, says the total number of cars built under the rapid amortization program now stands at 495,000.

ODM emphasizes, however, that no further applications are being accepted, and the expansion goal for freight cars is now completely closed. The freight car fast write-off program started April 11, 1952.

Oil refining and electric power facilities account for the bulk of 73 certificates for fast tax amortization granted by ODM in the two weeks ended April 18.

Total cost of the projects is $211.5 million, of which the government will permit fast tax amortization of about 60 pct. With the latest group of certificates, ODM has now granted write-offs to 20,916 facilities worth a total of $35.2 billion.

Largest among the latest certificates go to New England Power Co., Salem, Mass., which receives permission to write off 45 pct of the $22.7 million cost of new electric power generating facilities; Lockheed Aircraft, Sunnyvale, Calif., permission to amortize 60 pct of $11.3 million for military aircraft; and Phillips Petroleum Co., Sweeny, Texas, permission to write off 65 pct of $14.2 million for oil refining and alkylate facilities.

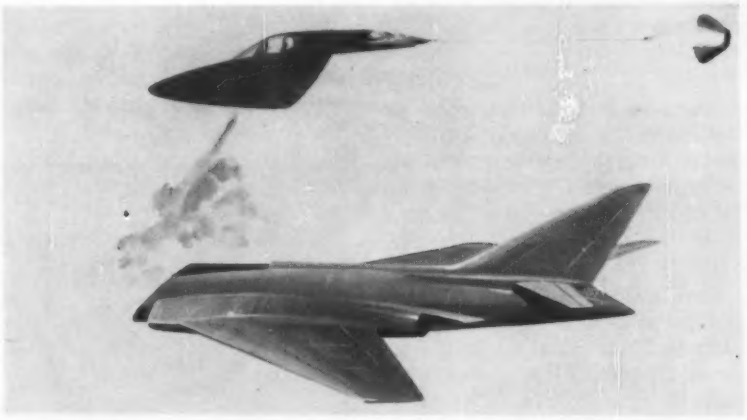
## Push Civil Defense

Officials of the U. S. Commerce Department report some success in their efforts to get industrial firms to prepare for a possible nuclear attack. But they are still straining to get the mass of medium and small companies to "wake up."

Many of the large firms such as U. S. Steel, Republic Steel, Alcoa, have followed the advice of the mobilization planners. They have established underground bomb-proof vaults, often in old mines, and are storing microfilm copies of key records. They have established a succession of management to take over in case some top brass are killed; and they have established secondary headquarters with independently-functioning communications equipment.

The department recently brought in some 70 industrialists for a briefing on the need and methods of setting up industrial defense programs. Business and Defense Services Administration says generally plant protection is sound. Installations are protected as well as possible against bomb damage, saboteurs, and other hazards. But management preparation for most firms must be strengthened, and plans must be made on industry-wide levels. BDSA is acting as the clearing house for the program.

## Air Escape and Survival



◆ HITTING the silk is no joke for jet pilots flying at altitudes where temperatures are sub-zero and atmosphere thin. The U. S. Navy's answer to the problem is for pilots to take their warm cockpits with them when they are forced to abandon ship.

A method was developed by Douglas Aircraft Co., under a contract with Office of Naval Research. The cockpit capsule is jettisoned from the crippled craft. At the same time a drogue chute (illustrated) is ejected to pull the main chute from its compartment, and to aid in decelerating and stabilizing the free falling unit.

Navy has indicated that the efficient operation, wide mission capability, high escape and survival percentage, reliability and economy which the new technique has, make it a strong candidate for modification to a standard which could be adapted to all Navy aircraft.

## EXPANSION IN INDUSTRY

# Aluminium Ltd.

### $250 million for new power project

Aluminium Ltd., world's second largest primary aluminum producer, will invest about $250 million on a new hydroelectric project on the Peribonka River in northern Canada.

Aluminum Co. of Canada, one of Aluminium's chief subsidiaries, is currently negotiating with the government of the Province of Quebec for the necessary rights.

If talks are successful the Canadian firm will put up $135 million immediately to begin construction.

Finished plant would be capable of developing about 800,000 hp, enough to support a minimum of 150,000 tons of new aluminum smelting capacity in the area. Initial power is expected in about three years after commencement of the actual building.

Nathanael Davis, president of Aluminium, declared that, added to the current program at Kitimat, British Columbia, the project would boost the company's capacity from 650,000 tons at the end of 1955 to more than one million tons by the end of 1959.

Considered in the announced cost of $250 million is construction of additional smelting capacity of about 120,000 tons in the area to make use of the additional power.

## Big Road Program

The whopping victory (388 to 19) won by President Eisenhower's highway bill in the House is bringing a lot of on-the-fence Senators around to the idea that a bold new roadbuilding program is an election year "must."

Legislation endorsed by the House of Representatives, currently pending in the Senate, calls for state and federal expenditures totaling $51.5 billion for roadbuilding over the next 13 years. The program is to be financed by higher taxes on gasoline, tires, and trucks.

Highlights of the vast new construction program:

(1) Of the $51.5 billion total, $27.5 billion is to pay for interstate network of superhighways connecting most state capitals.

(2) The Federal Government will match states in repaying utility companies for relocating poles, pipelines, and other facilities.

(3) Gasoline and diesel fuel taxes are to rise by 1¢ per gallon; tax on tires by 3¢ per lb; tax on trucks, buses and trailer, by 2 pct.

## New Titanium Plant

First commercial production of titanium sponge in the U. S. by any method other than magnesium-reduction has been accomplished by Electro Metallurgical Co., division of Union Carbide and Carbon Corp., at its new plant at Ashtabula, Ohio.

Using the new method, sodium reduction, Electro Met expects to turn out about 7500 tons of titanium metal sponge annually at Ashtabula.

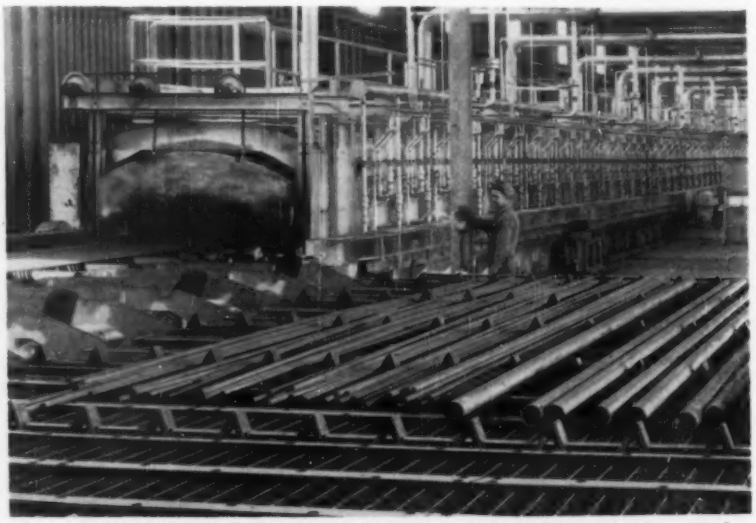
This installation is said to be the largest of its kind to be built to date.

## Expansion Briefs

**Westinghouse Electric Corp.;** new plant for manufacture of switchgear distribution apparatus; Bloomington, Ind.; production expected by late 1957.

**Electric Motor Div.,** A. O. Smith Corp., Dayton, Ohio; new administration building as initial step in $3.25 million expansion project; cost about $350,000; new $1 million manufacturing plant set for early 1957; $2 million in equipment to be installed this year and next.

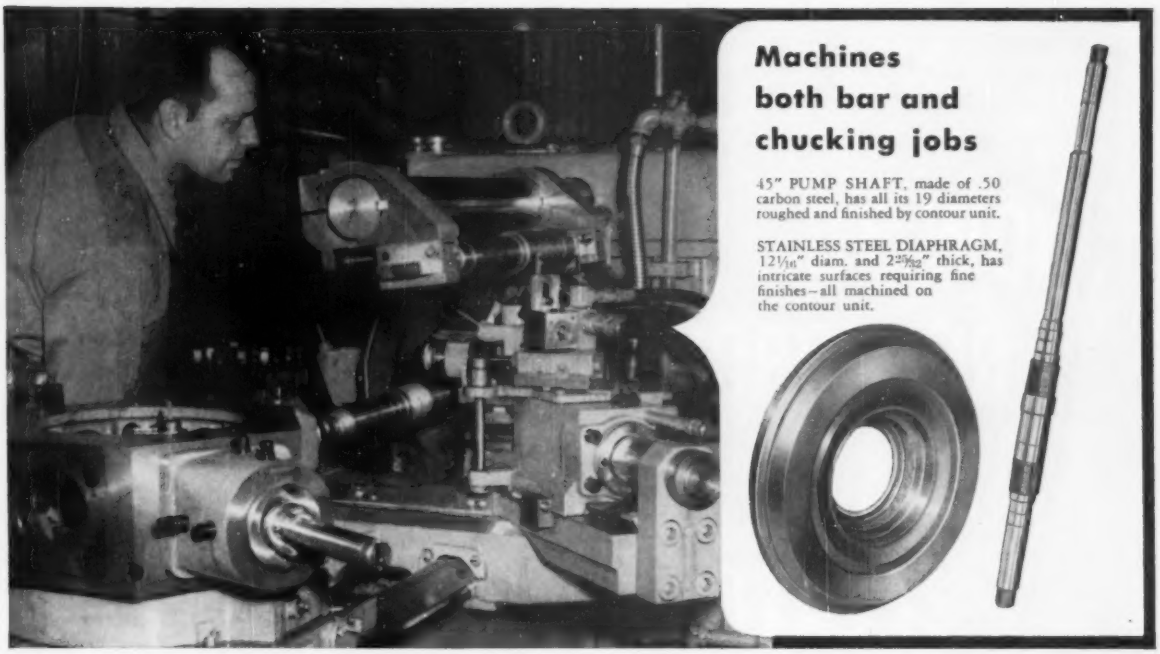
**Federal Machine and Welder Co.,** Warren, Ohio; increase production facilities in 1956; cost about $750,000.



SEAMLESS TUBING rolls from new $245,000 roller hearth furnace at Timken Roller Bearing Company's Gambrinus steel mill at rate of 4000 tons per month. The plant will supply tubing to auto and oil industries.

## WARNER & SWASEY WITH NEW CONTOUR UNIT

# DOES FULL DAY'S WORK IN 66 MINUTES!



**Machines both bar and chucking jobs**

45" PUMP SHAFT, made of .50 carbon steel, has all its 19 diameters roughed and finished by contour unit.

STAINLESS STEEL DIAPHRAGM, 12 1/16" diam. and 2 25/32" thick, has intricate surfaces requiring fine finishes—all machined on the contour unit.

J. S. COFFIN, JR. COMPANY, Englewood, N. J. accomplished this startling time reduction on the 45" pump shaft, shown above. They transferred it from a fairly new standard turret lathe to a 2-A Extra Heavy Duty Turret Lathe equipped with Warner & Swasey's new Contour Unit.

This shaft, for their boiler feed pumps, has 19 different diameters, with as little as .010" difference between some adjacent diameters. It also has a taper and four Class 3 threads. Previously, it required 7 hours of machining on a standard turret lathe, using accepted turret lathe practice—indicating the money-saving advantages of this new Warner & Swasey Contour Unit.

Now the shaft is quickly cut down from 3 1/4" bar stock to finished diameters ranging between 1 3/8" to 2 7/8" using the separate rough and finish cutters in the hydraulically-operated unit's turret. It is roughed out with two and three cuts using the same cutter by simply flipping the tracer unit's leaf stops. A finish cut is then taken over the entire length of the shaft. From start to finish—only 66 minutes, including many other conventional cuts!

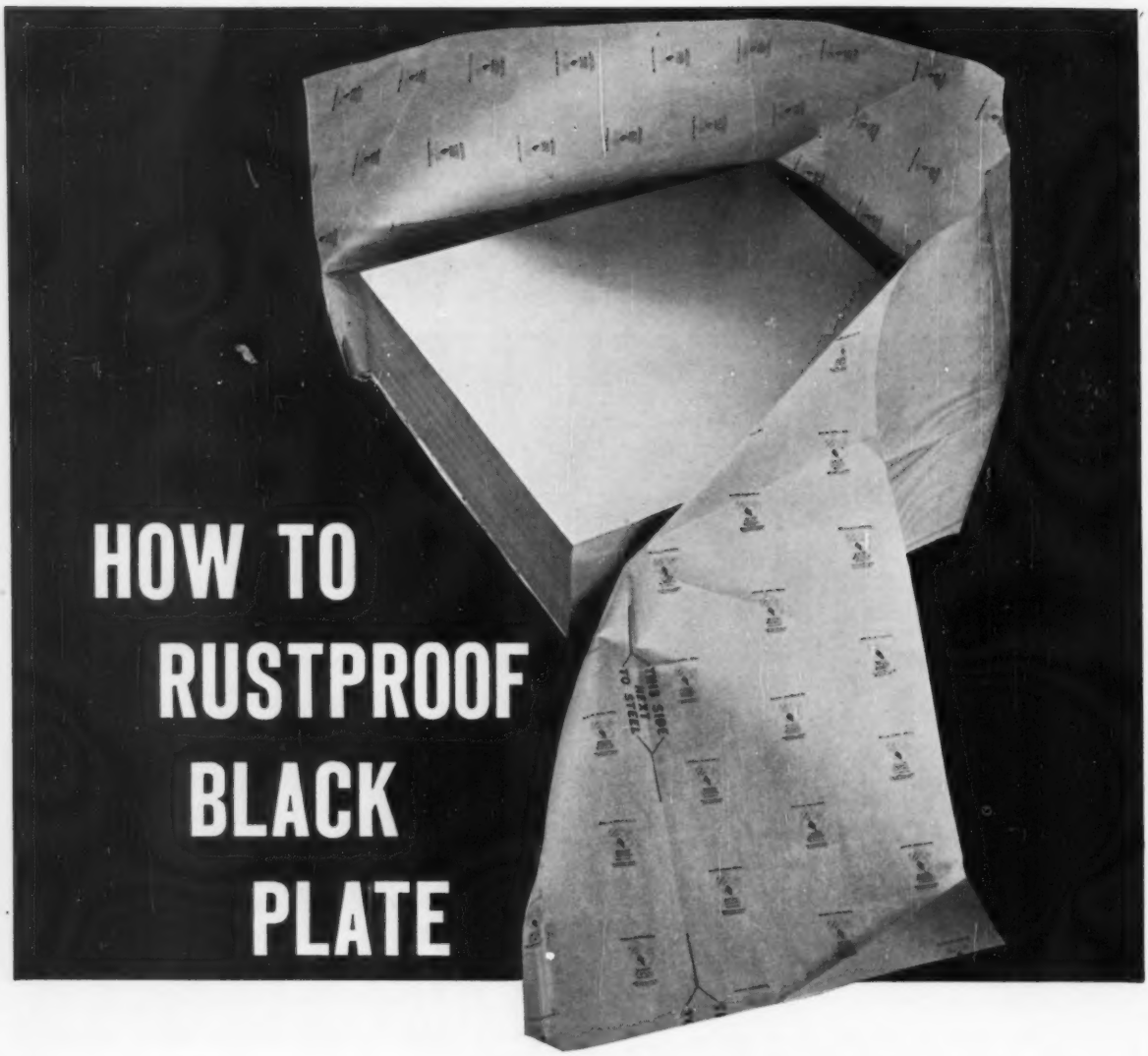
This unique contour unit also machines the intricate stainless steel diaphragm shown, providing Coffin similar time savings.

Operators like the unit's fast setup, and the over-all ease of machine handling that results from the 2-A's automatic head shifting. After pre-selecting his speeds, and pushing the master lever, an operator can position tools for the next cut while the head automatically shifts.

This story shows the time and money-saving possibilities this new, versatile combination of turret lathe and contour unit opens for you. For the complete facts on how it can cut costs for you, call in your Warner & Swasey Field Representative.

WARNER & SWASEY
*Cleveland*
PRECISION MACHINERY SINCE 1880

**YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY**



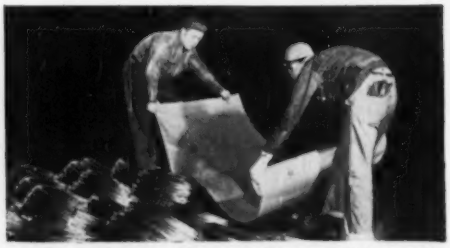

Rust is a problem anytime, but it's particularly serious with black plate. On this light gauge, dry, uncoated steel, rust can start from a fingerprint. "Sweating" due to sharp temperature changes will cause immediate rusting on surfaces and edges.

Leading mills are now eliminating rust problems by packaging black plate in Ferro-Pak, Cromwell's volatile corrosion inhibitor paper. Chemical vapors from Ferro-Pak form an invisible film around the steel that prevents rust from getting a start, even when moisture is present.

The new Ferro-Pak sheet above was custom-made by Cromwell's "Paper Engineers" to meet steel mill requirements for shipping black plate and dry sheet steel. It is water-proof, strong, yet highly flexible and easy to handle. Its chemical rust inhibitor is non-toxic . . . compatible with oil . . . stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write **Cromwell Paper Company, 4803 South Whipple St., Chicago 32, Illinois.**

# FERRO-PAK® by Cromwell
## "Paper Engineers"



*RUSTPROOFING A FREIGHT CAR. Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.*

# REPORT TO MANAGEMENT

### How to Treat Stockholders

As a reader of the financial pages, you must have been amused, enlightened, outraged, or in some way affected by stockholders meetings that occurred early this year. Possibly you were one of those who faced the stockholders yourself.

**There is no doubt but that some** competent, hard working, and sincere company officials were badly treated by a few stockholders. In some cases, the offenders were labor leaders with axes to grind, semi-professional hecklers, and even well meaning or poorly informed stockholders.

**But in general, presidents who** tried to tell their stockholders the whole story, even if it might not be entirely favorable, fared pretty well. It indicates that there is a growing awareness of responsibility to those who have an interest in the company, and also more understanding of company problems by shareholders.

### Both Sides Benefit

The present stockholders meeting is not a one way street, with the company absorbing all the abuse and gaining nothing in return. In a way, it's a method of communication between management people and those who depend on them to run the company to their mutual advantage.

**The days in which a company** president felt the stockholders meeting was nothing but a headache appear to be past. That doesn't mean that it will always be a pleasant job, but it's an important one that can pay off in many ways.

**You will notice, for example, that** Ford Motor Co., with its first annual meeting coming up shortly, made a thorough study of meetings of other large companies to make sure that its new group of shareholders have full opportunity to take part.

**It's probably more important** for a company that is strictly a manufacturer of consumers goods to have a successful annual meeting. But in these days when risk and investment capital is hard to come by, and most companies trying to broaden corporate ownership, courteous meetings are worthwhile.

### Expansion Holds the Key

As the months go by, there is more and more indication, or proof, that 1956's remarkable record is tied in with capital spending.

**With autos lagging and appliances** as competitive as possible, it's the makers of heavy equipment who boast the backlogs of unfilled orders.

**That's what's causing** all the uproar over tightening the money market through higher interest rates. Since most expansion and capital goods money is borrowed money, there is a possibility that plans for expansion and capital goods outlays may be cut back by more difficult financing.

**It isn't an open and shut** case, however. As pointed out previously, the Federal Reserve Board is in the middle. But tampering with the money market is extremely delicate in an economy that is so dependent on expansion programs.

### What's Happening in Copper?

Copper has frequently been called the inflationary metal, and with some justification in view of steadily rising prices. But there has been some noticeable easing in supply in recent weeks.

**It may be premature to predict** any permanent easing. There are too many labor hurdles and negotiations just ahead. But there has been significant easing in European demand, which means that more copper from Chile will be available for U. S. consumers. Not much—but some.

# INDUSTRIAL BRIEFS

**Tipping Your Hats** . . . Canadian Titanium Pigments Ltd., a subsidiary of National Lead Co., has begun construction of Canada's first titanium pigment plant at Varennes, Quebec. The plant will be built at a cost of $15 million and the entire output of titanium pigment will go to Canadian industry. Production is expected to begin next year, and will give permanent employment to about 300 people.

**Lab Loot** . . . During the past decade, research spending in the U. S. has totaled about $32 billion, $4.5 billion in 1955 compared to $10 billion invested in all the years from Colonial days through the end of World War II, according to Henry F. Dever, president, Scientific Apparatus Makers Association.

**No Marilyn Monroe?** . . . A new 16 mm. colored sound movie entitled "The Shape of Things," deals with the Forging & Casting Plant of Allegheny Ludlum Steel Corp. It depicts the forging and casting of tools and end products made by Allegheny Ludlum's plant in Ferndale, Mich. Movie can be obtained by organized groups on request to the Advertising Dept., Oliver Bldg., Pittsburgh.

**No More Discounts** . . . Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y., has initiated a new system of pricing machine, carriage and lag bolts on a net basis. Replacing the traditional practice of pricing on the basis of lists and discounts, the new schedules indicate direct factory costs to distributors of full cases and 20,000 pound lots. Prices are for regular packaged stock and larger and longer sizes normally shipped in bulk.

**Not for Breathing** . . . Pennsylvania Engineering Corp., New Castle, Pa., has been awarded a contract by Kaiser Engineers to fabricate the two largest oxygen converters in the world. Two top blown oxygen steel converters of 65-ton capacity will be fabricated for installation at the Aliquippa Works, Jones & Laughlin Steel Corporation.

**Added Pounds** . . . The Kenosha Wis. Div. of American Brass Co. has completed a strip mill modernization program which has increased mill speeds and raised the limit on coil weights handled from 800 to 3000 pounds. The program was undertaken in cooperation with the Rolling Mill Div., E. W. Bliss Co., Salem, Ohio.

**Moving West** . . . Jessop Steel Co., Washington, Pa., has appointed the Ray J. Dearmin Co., Maywood, Calif., as tool steel distributor in Southern California. Dearmin will warehouse Jessop's tool steel in bar and billet form.

HORATIO Alger award for 1956 goes to W. Cordes Snyder, Jr., president of Blaw-Knox Co.

**Need Advice** . . . Pickard and Warren Associates, management and engineering consultants on atomic energy, has been formed in Washington, D. C. Firm is advising industrial companies and electric utilities on civilian applications of nuclear power. Services include market analyses, technical-economic studies, nuclear power system evaluations, and general engineering assistance.

**Empire Building** . . . Empire Steel Castings, Inc., Reading, Pa., has installed two new $85,000 Ajax induction melting furnaces to increase its line of corrosion resistant steel castings.

**Stop the Presses** . . . Abitibi Power & Paper Co. Ltd., has announced a $22 million expansion program for its Fort William, Ont., plant to increase newsprint production by 1958 to over 150,000 tons a year from its present rate of 65,000 tons. The program includes a 276-in. high speed newsprint machine which will operate initially at 2,000 fpm, but will be designed for a maximum of 3,000 feet.

**Vitamins for Mines** . . . Kennecott Copper Corp. will embark on a $40 million program to extend the life and reduce production costs of its Ray Mines Arizona Division. Program is expected to result by 1958 in a 20,000 ton increase in the Division's annual copper production. In 1955, Ray produced about 50,000 tons of copper.

**Tough To Tap** . . . Reynolds Metals Co., Louisville, Ky., has placed into operation a private line telephone network which can handle 360 calls per hour, costing $250,000 per year.

.....at

# ILLINOIS GEAR

*Quality always comes first*

***Quality** that you can trust* characterizes every step of the manufacture of ILLINOIS GEARS.

Skilled craftsmen equipped with the world's finest and most modern tools, plus precision inspection and quality control, with extremely careful attention to materials, heat treatment and tolerances, all combine to produce the finest gears in America.

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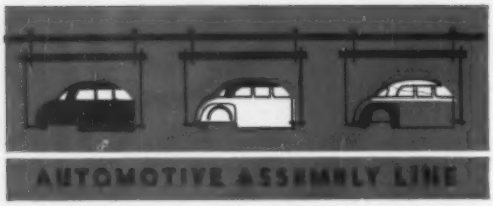


# How AMC Meets Tightening Competition

**American Motors avoids meeting Big Three head on . . . Rambler fills market gap not covered by other producers . . . Diversification and defense profits broaden operations . . . Outlook encouraging—By *T. L. Carry.***

◆ THE ADMITTED serious financial situation of Studebaker-Packard Corp. has raised the question as to how the industry's other Independent producer, American Motors Corp., is surviving the increasing pressure from the Big Three.

AMC celebrates the second anniversary of the merger of Nash-Kelvinator and Hudson this week. A comparison of the two Independents shows how each is basically different from the other, and also indicates why, at the present time, AMC has the competitive edge over Studebaker-Packard.

American Motors is a bigger company and is more diversified. In addition to its automotive production, the company is also engaged in making home appliances. has a comfortable amount of defense contracts and an increasing export business.

**Profits from Kelvinator . . .** These non-automotive lines are making money. Since 1929, the Kelvinator Div. has lost money only once. That was in 1946 when it was reconverting to civilian production at the end of World War II.

The present volume of defense production is at an annual rate of about $18 million. Since the merger, AMC has acquired 10 defense contracts in the fields of production, research and engineering. In addition, the company is presently negotiating two other projects with the government and expects to reach the contracting stage in the next 2 months.

In the export field, Kelvinator's sales are up 47 pct for the first 6 months of this fiscal year compared to the same period in 1955. The division has also added four new plants to its foreign facilities.

**Cut Costs . . .** Since the merger, AMC has made a great deal of progress in cutting its loss level. It has consolidated its manufacturing facilities and liquidated those that were considered obsolete or no longer necessary.

Perhaps the biggest difference between the two Independents is AMC's approach to the automotive business.

Two years ago, American Motors decided not to challenge the Big Three on a head-on basis. The plan was, and still is, to outflank them by supplying a product to the public that none of the Big Three produces.

American Motors has never tried to be a full line company. As a result, the corporation has been able to concentrate its manufacturing and tooling costs. And, by not competing across the board, it has been able to establish for itself a more or less exclusive market with the production of the Rambler.

**Rambler Sells . . .** George Romney, youthful president of AMC, says the Rambler combines the passenger space and comfort of the large American car with the exterior compactness and economy of operation of the small European car.

As proof that the Rambler is making a place for itself in the industry, Mr. Romney cites the lat-

## How American Motors Hopes to Thrive

**Specialized approach to auto market.**

**Rambler fills market gap not touched by Big Three. It permits concentration of tooling effort.**

**Diversification of production.**

**Kelvinator is a profitable appliance maker. Defense business is comfortable, with prospects for more.**

**Help from foreign markets.**

**Export business is up 47 pct this fiscal year. Company has added four new plants to foreign facilities.**

# How New Chromium plating process solves problems for two companies

♦ **"Crack-Free" Chromium gives washing machine shafts solid protection from rust**

♦ **Manufacturer eliminates undercoats for die cast hardware with new Unichrome process**

Unichrome Crack-Free Chromium Plating is proving superior to ordinary chromium in certain types of applications . . . especially where durability and protection are at stake.

### PROVES IDEAL IN WASHING MACHINE

Steel drive shafts in well known washing machines are now plated directly with Crack-Free Chromium about .0005" thick. Unlike *ordinary* chromium, this deposit has no microscopic cracks to admit water, humidity, soap and detergent spillage. Shafts stay rust-free, and get extra wear-resistance besides.

### ONE-STEP PLATING OPERATION

Chromium was the finish wanted for new line of zinc die cast cabinet hardware. Also wanted was a process that would permit the company to get into immediate production with an existing tank. Unichrome Crack-Free Chromium satisfied both needs. The company now plates directly on the castings, eliminating copper and nickel plating stages, extra handling, and need for major new equipment. The matte gray finish is buffed up readily to high lustre.

*This is just one of many Unichrome developments in processes, equipment and materials which provide opportunities to cut your finishing costs . . . opportunities to turn out a better product through a better finish. We'd welcome the chance to work with you.*

PLATING MATERIALS
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TIN & TIN CHEMICALS
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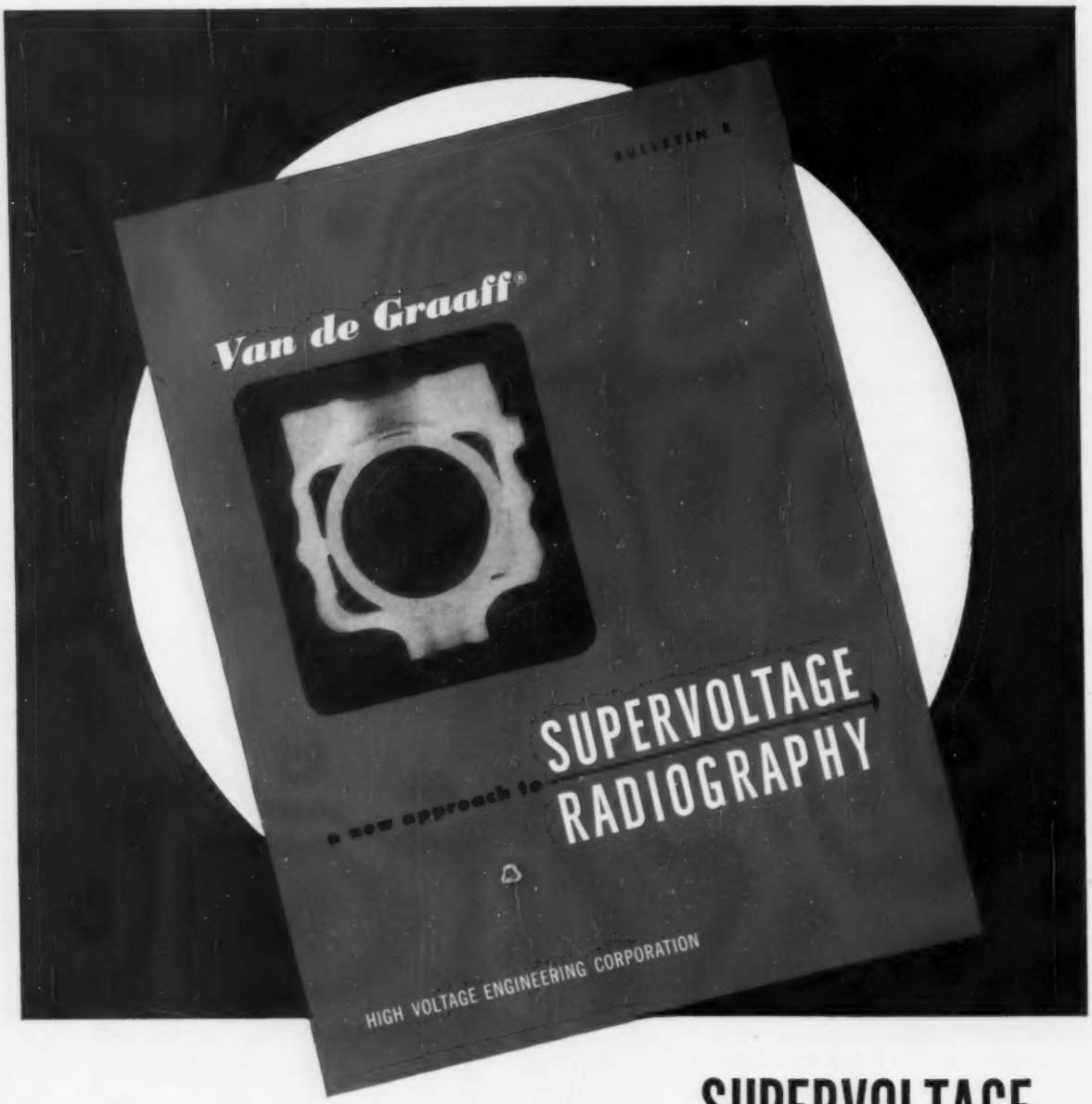


## Here's up-to-the-minute information on high-quality SUPERVOLTAGE RADIOGRAPHY

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- *how it can speed up inspection*
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- *case histories from various industries*
- *costs for equipment, installation, and operation*
- *how to choose the most economical supervoltage equipment*

Whether you need detailed data to help you choose the right equipment or to give management the facts about savings possible with supervoltage radiography, you'll find valuable information in this 28-page bulletin.

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HIGH VOLTAGE ENGINEERING CORPORATION

7 UNIVERSITY ROAD CAMBRIDGE 38, MASSACHUSETTS

**Automotive Production**

*(U. S. and Canada Combined)*

| WEEK ENDING | CARS | TRUCKS |
|---|---|---|
| APRIL 28, 1956 | 141,340 | 25,973 |
| APRIL 21, 1956 | 141,388 | 26,246 |
| APRIL 30, 1955 | 195,586 | 35,435 |
| APRIL 23, 1955 | 190,888 | 34,186 |

*Estimated. Source: *Ward's Reports*

est sales figures. During the first quarter this year, when industry factory sales were off 11.4 pct, Rambler sales increased 17.3 pct. Registrations during January and February were up 38 pct over the like period in 1955 compared to an industry decline of 4.05 pct.

As a result of this flanking movement, AMC can still break even, although its production might fall below 200,000 units per year.

In addition, Mr. Romney says that the company doesn't require a large financing program for its 1957 models. The bulk of the tooling costs for the next 2 years has already been taken care of. The company is presently producing its new V-8 engine and has made a major change in the Rambler this year. Its present working capital is approximately $62 million.

**Future Looks Good . . .** Looking ahead, Mr. Romney sees nothing but progress for American Motors. The financial report for the first 6 months of the company's fiscal year will show a loss of less than $1 million compared to a loss of nearly $7 million for the entire last year.

Mr. Romney says the company would have completed the period at a profit except for the heavy expense involved in bringing out the new engine and completely redesigning the Rambler.

## GM And Congress

Future expansion of the energetic automotive industry is to be influenced by the amount of importance the government attaches to a new Senate subcommittee report questioning the right of General Motors Corp. to operate by its present methods.

Bigness and evil are not synonymous, writers of the report admit. Nevertheless, they stick closely to the theme that if one or more of the GM enterprises were made independent the effect on competing firms and perhaps the general economy would be beneficial.

**Major Points**

Principal stands taken to the report, as summarized by Sen. O'Mahoney, D., Wyo., acting subcommittee chairman, are these:

1. GM, with its subsidiary, General Motors Acceptance Corp. (GMAC), has wielded its financial strength in edging out competitors in the automobile, bus, and diesel locomotive fields. If GM were divested of GMAC, national economy would not be harmed and competition might be strengthened.

2. It may be time to "institute action" to keep multiple producers of buses in business. (GM is cited as the builder of more than 80 pct of all U. S. motor buses.)

Efficiency of the GM operation caught the interest of the subcommittee. In 1955, states the report, after taxes and bonus provisions, GM made profits equal to about 31 pct of its net worth, compared to about 12 pct for manufacturing firms as a group. Report deduces that the firm's financial strength bolstered its chances of success in any new activity it started.



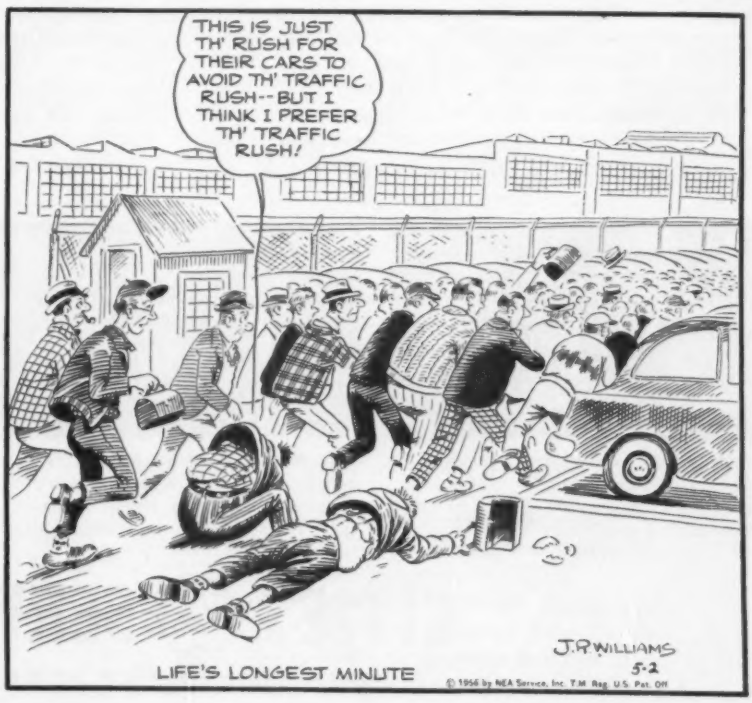
## Sales Still Sag

Further downward adjustments in new car production are in the cards for May and June.

Revisions have been forced because the expected seasonal upturn in sales so far has not materialized to the extent expected. New car stocks presently average out to about a 40-day supply for each dealer. This is down slightly from what it was in March and February but not as much as predicted.

The 1957 cars are going to cost more for many reasons. The price of raw materials, notably steel, will increase appreciably. In addition, tooling for the new models this year is expected to reach a record $1 billion.

**THE BULL OF THE WOODS** By J. R. Williams


THIS IS JUST TH' RUSH FOR THEIR CARS TO AVOID TH' TRAFFIC RUSH--BUT I THINK I PREFER TH' TRAFFIC RUSH!
J.R.WILLIAMS
5-2
LIFE'S LONGEST MINUTE
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# Granite City saves fuel, raises production and quality with Cities Service Heat Prover!

**Nation's 14th largest steel producer uses Heat Prover on soaking pits, open hearth furnaces and on their annealing furnaces.**

Granite City Steel burns enough fuel in one year to heat a five-room house for 38,000 years!

Obviously, if this fuel burns inefficiently, the loss could be staggering. But Granite City has no worries on that score. "Thanks to the portable Cities Service Heat Prover, we get better fuel efficiency, better quality, greater production than ever," they report.

"Because it provides a quick, highly accurate check of fuel-air ratio, the Heat Prover has proved invaluable in controlling combustion conditions in open hearth furnaces, soaking pits, and annealing and normalizing furnaces. In a matter of seconds it tells our engineers how efficiently the furnaces are working—whereas former tests often took hours and didn't provide as accurate a picture. Anyone in this business can probably benefit from this ingenious device."

Supplied and maintained free by Cities Service, the remarkable Heat Prover is today used and applauded by scores of major steel producers. If you'd like to learn how it could simplify your operation as it has theirs, talk with your local Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

**20TH CENTURY BLOWGUN**—a bazooka—is readied by technicians for tapping open hearths. They are part of Granite City's 4800 skilled employees.

**HEAT PROVER AT WORK** at back of open hearth furnace. In minutes it provides accurate check on furnace efficiency—saves hours required by former testing.

**CONTROL TOWER** at blooming mill guides ingots as they pass through rollers. Granite City has capacity of 1,200,000 net tons of ingots annually.

CITIES SERVICE

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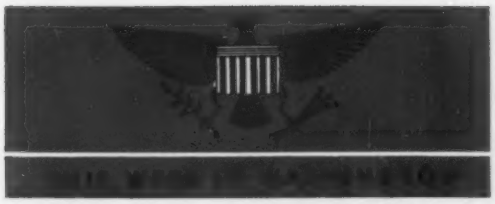

# What's Up John L. Lewis' Sleeve?

**Washington doubts that any tough wage drive is ahead . . . Rest of $2 per day raise went into effect April 1 . . . Improved wages may forestall higher prices . . . Court delays labor politics ruling—By G. H. Baker.**

◆ HIGHER COAL prices this year? Most government officials doubt it. They don't believe John L. Lewis will push new wage demands on the heels of the steel wage negotiations now going on.

Besides, Ike's business advisors point out, Lewis won a $2-per-day pay rise for his United Mine Workers only last year. The second installment (80 cents per day) of this $2 rise went into effect April 1.

Miners are now working more hours per week than they have for several years. For example: Bituminous coal production last year totaled 470 million tons. This year it will exceed 500 million tons.

The UMW soft coal contract can be reopened this fall, but Lewis customarily does not show his hand until the last minute. If the currently brisk demand for coal holds up, he is likely to omit new wage demands this year.

Lewis is well aware that the "sick" coal industry has to be helped back onto its feet, and he may well decide to forego new wage demands in the interests of letting coal industry management put on a little financial weight.

## Atomic Power Aid

Congress, seeking to remove another stumbling block to industrial development of nuclear power, may exempt industrial firms participating in atomic power projects from the Public Utility Holding Act.

A spokesman for a group of 26 industrial and utility firms banded together in the non-profit Power Reactor Development Co., tells a Senate Commerce subcommittee that they will not go ahead with plans to build an experimental reactor in Michigan unless automatic and permanent exemption to the act is granted.

Provisions in the present Securities and Exchange Commission laws require that all investors in any type of power project be subject to the tight srcutiny of the SEC. This is also holding back other firms from investing in experimental power reactors, according to Walker L. Cisler, president of the Power Reactor firm and of Detroit Edison Co., one of the principal participants in the project.

The firms plan to contribute $25 million toward the $40 million cost of the experimental reactor. Steam the reactor generates would be purchased and turned into electricity by the Edison firm. None of the participating firms can receive any profits or returns from the project other than know-how as a result of their participation, Mr. Cisler says.

## Labor and Politics

The U. S. Supreme Court has decided to look into the question of politicking by unions, but not until the 1956 election campaigns are over.

The court agreed to look into union political expenditures after the Justice Department appealed a decision lost to the United Auto Workers in federal district court at Detroit.

The Justice Department charges that Walter Reuther and the UAW have violated the law by spend-

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## Where Atomic Energy Money Goes

The Senate is considering a bill to spend $295 million on new government atomic energy facilities.

One of chief features of House-approved legislation is a broad research program to speed development of peaceful nuclear power.

Here's how bulk of the $295 million would be spent:

**$113 million for reactor development.**
**$57 million to produce fissionable materials.**
**$28.6 million for research.**
**$3.2 million for a raw materials laboratory.**
**$1.5 million for Pacific proving ground construction.**
**$554,000 for Los Alamos town facilities.**
**$400,000 for medical facilities.**

# in 12.6 seconds— induction hardened by Cincinnati

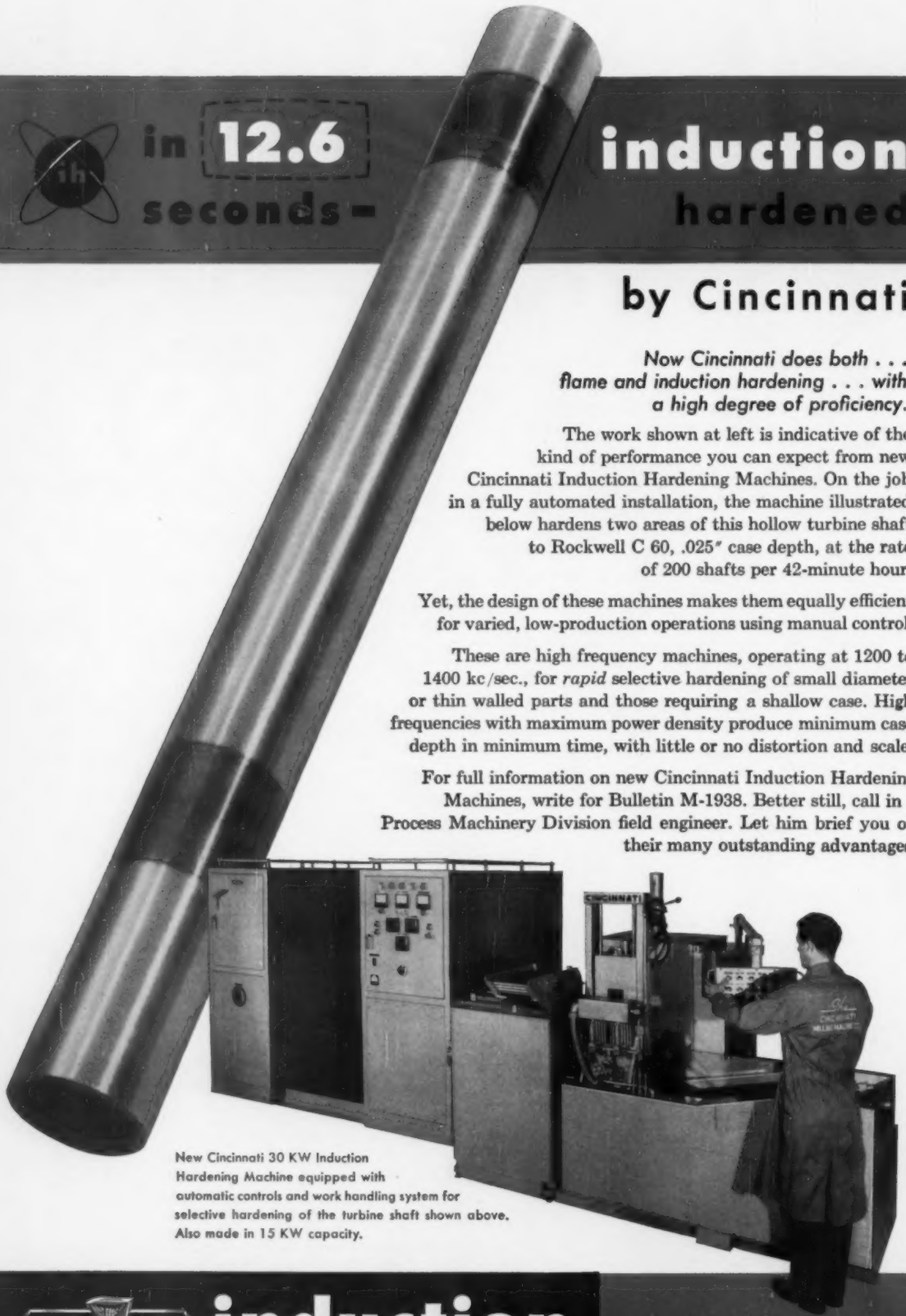
*Now Cincinnati does both . . . flame and induction hardening . . . with a high degree of proficiency.*

The work shown at left is indicative of the kind of performance you can expect from new Cincinnati Induction Hardening Machines. On the job in a fully automated installation, the machine illustrated below hardens two areas of this hollow turbine shaft to Rockwell C 60, .025″ case depth, at the rate of 200 shafts per 42-minute hour.

Yet, the design of these machines makes them equally efficient for varied, low-production operations using manual control.

These are high frequency machines, operating at 1200 to 1400 kc/sec., for *rapid* selective hardening of small diameter or thin walled parts and those requiring a shallow case. High frequencies with maximum power density produce minimum case depth in minimum time, with little or no distortion and scale.

For full information on new Cincinnati Induction Hardening Machines, write for Bulletin M-1938. Better still, call in a Process Machinery Division field engineer. Let him brief you on their many outstanding advantages.



New Cincinnati 30 KW Induction Hardening Machine equipped with automatic controls and work handling system for selective hardening of the turbine shaft shown above. Also made in 15 KW capacity.

CINCINNATI **induction** *hardening*

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

ing union funds to elect "friendly" candidates. (TV commercials in the Detroit area, urging election of Democrats.) The union and Federal Judge Frank A. Picard say the political expenditures were not the kind barred by the Taft-Hartley law.

The government has been pressing the Supreme Court for a quick answer to this problem, in order to settle the matter in time for this year's election campaigns. But the high court declines to pick up what it considers a hot potato in an election year.

UAW officials, noting the new court decision to shelve the matter until fall, said they would continue to campaign for "friendly" candidates.

## Red Trade:

### Non-strategic trade eased by new ruling

Manufacturers and exporters may now ship about 700 non-military items--including abrasives and many types of hardware, metal manufactures, wire, and industrial machinery—to Russia and its European satellites without special export licenses.

The items are those for which the Government has been freely granting licenses for the past several months, so the effect of the relaxation is to cut red tape.

Secretary of Commerce Sinclair Weeks, in announcing the relaxation of export rules, says the move is designed to carry out the Government's objective, first announced by President Eisenhower at Geneva last July, "to create conditions which will encourage nations to increase the exchange of peaceful goods throughout the world."

#### No Strategic Goods

Prior to April 27, exporters desiring to ship any of the 700-odd items to Russia or a Red satellite country were required to file applications with the U. S. Dept. of Commerce for export licenses. The effect of the relaxation is to suspend license-filing.

Shipment of so-called "strategic goods" to Russia or Red-dominated countries still is prohibited.

Official U. S. Commerce Dept. figures show that U. S. exports to Communist countries have risen substantially in recent months.

Export licenses for shipments to Communist countries in the first quarter of this year were valued at $8,788,543. The value in the previous quarter was only $1,624,856. In the first quarter of 1955, the exports were valued at $4,968,322.

#### What's Permitted

Actual shipments, however, lag behind the figures shown on export licenses. U. S. exports to European Communist countries in the fourth quarter of 1955 totaled $1,151,000 as compared with $1,051,000 in the third quarter of 1955. For the entire year of 1955, U. S. exports to Red countries were valued at $7,248,000, as compared with $6,120,000 for 1954, and $1,776,000 for 1953.

Included in the new list of products that may be shipped without export license are all types of footwear except military, leather, dyes, rubber products, drugs and pharmaceuticals, beverages, fibers, wood, paper products, glass, clay products, cutlery, hardware, cork, electrical household appliances, commercial refrigerating equipment, office machines, pigments, paints, chemical specialties, soil improvement compounds, soap and toiletries, photographic equipment, plumbing fixtures, optical goods, musical instruments, toys, dental equipment, jewelry, lamps, sponges, notions, beauty and barber supplies.

WASHINGTON NEWS

## Is Wife Deductible?

A businessman may deduct the legitimate costs of going to and attending a business convention, but not sightseeing or generally the expenses of his wife or family if they accompany him, the internal revenue service rules.

Tax laws permit deductions for normal business purposes. But the IRS says that expenses not directly connected with business conventions and other trips are not deductible.

The wife's expenses when she goes along are not tax-free either, even if she types up notes an attends some sessions, unless her presence is actually necessary to conduct the business of the meeting. But when a conventioning businessman brings the wife along, he is permitted to deduct the normal full single expenses.

Some other examples of when traveling costs are not deductible: A businessman does some sightseeing and entertaining unrelated to his convention, and stays for a post-convention cruise.

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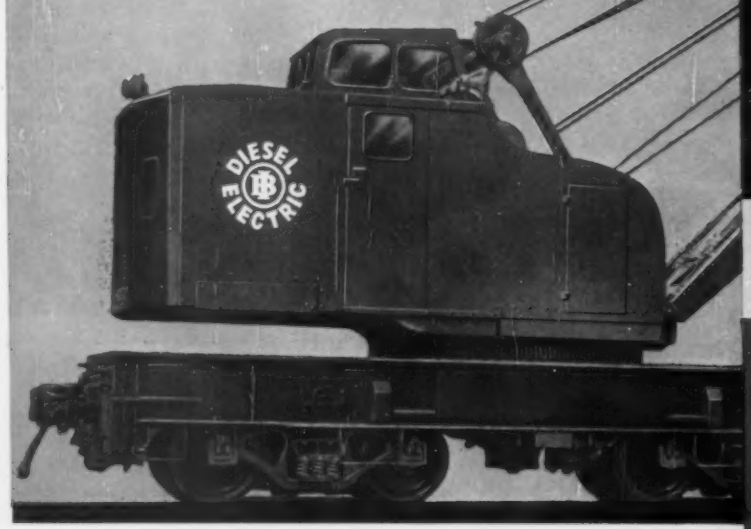
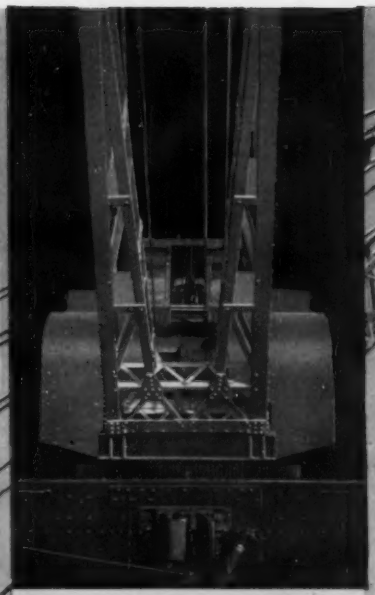
## Automation: Secret Weapon of Cold War

- **Despite supremacy claims in almost every other direction, even Soviet officials admit worker productivity lags behind U. S.**
- **In Pravda, a top Russian official laments that U. S. productivity is 2½ times higher than in Soviet Union, because of higher mechanization and automation.**
- **"The gap has been narrowed, but the Soviet lag is still serious," Pravda says.**
- **But U. S. Dept. of Labor observes that any narrowing of the gap must have occurred before 1937, because indications are that Red productivity then reached 40.5 pct of this country's.**

# FASTER and SAFER crane operation

## with BROWNHOIST patented monitor type cab and clear vision boom



This view from below shows you the great visibility right through the middle of the Clear Vision Boom.

Windows on all sides of the raised Monitor Type Cab of a Brownhoist Locomotive Crane give the operator a full view of the area in which he is working, and the open type Clear Vision Boom lets him look right down at the work itself. This complete 360° visibility—to the sides, to the rear, and forward into the car—allows the operator to work more rapidly, without unnecessary crane swinging, and also increases safety by eliminating blind spots. The patented Monitor Type Cab has a door on each side, and all doors and windows can be opened for ventilation. A soundproof partition separates the operator from the engine and controls are placed within convenient reach of his adjustable seat. These factors assure ease of operation of the Brownhoist Locomotive Crane, and Brownhoist engineering assures maximum performance. Anti-friction bearings are used throughout including machinery side frames. The boom hoist is worm driven for smooth, safe operation. Dynamatic clutches disconnect all upperworks when travelling . . . give sure, positive control. High strength alloy steels bulwark the machine for heavy service. Throughout, Brownhoist Locomotive Cranes are designed and built for high capacity production. For further information write today for Catalog No. 548.

Approximate visibility from ordinary cab.

Approximate visibility from side-operated cab.

360° visibility from I. B. patented Monitor Type Cab.

Your operator can see exactly what he's working with in the car in front of him. Greater safety is the result.

188

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

**INDUSTRIAL BROWNHOIST CORPORATION**
**BAY CITY, MICHIGAN** • DISTRICT OFFICES: New York, Philadelphia, Washington, Cleveland, Chicago, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

SUBSIDIARY OF Penn-Texas

# BROWNHOIST

# High Steel Output Not Enough

**Western mills going full blast . . . But consumers still forced to go East for 40 pct of their needs . . . Current expansion programs won't be enough . . . Market looks tight all 1956—By *R. R. Kay.***

◆ "WE'VE GOTTA have more steel!" That's the common complaint everywhere in the seven Farwestern States.

Although steel consumers here will use 6.5 million tons this year —a new record—this is far short of what they want.

Farwestern mills turned out 3.7 million tons of finished steel last year. With 40 pct of the steel used here coming from Eastern mills, their stake in this market is safe —and for many years.

**Far Short** . . . For last 20-years there has been king-sized gap between market and production in the seven Farwestern States. Despite present planned increases in steel capacity, this gap won't get much smaller for many years.

Why? By the time the recently announced capacity hikes are a reality, the Farwestern economy, still growing, will absorb this, and need still more. The 20-year market-production spread will remain as big as ever unless steelmakers here expand more rapidly.

THE IRON AGE has information that one of them right now is sharpening his pencil to figure the 1960-1965 market.

**Common Knowledge** . . . Here are the only publicly-known plans for more steel production: Columbia-Geneva Steel Div. of U. S. Steel is jacking up capacity at its Utah works by 381,000 tons, says it will fully integrate its Pittsburg, Calif., mill; and Kaiser Steel Corp. will up finished products capacity at its Fontana, Calif., Works to 1,528,000 tons.

**Current Situation** . . . How does the steel supply picture look for the rest of this year? Not too bright. Flat-rolled products will be extremely tight. Big construction boom will tax reinforcing bar production. And Farwestern mills, going full blast, won't be able to produce more than half the tinplate needs. Furniture, communications, and auto assembly industries will needle the mills for more wire products.

## Truck Improvement

Interested in trucks? Here's something new. The XD-30 is now coming off production lines of Kenworth Motor Truck Co., Seattle. It's a $26,000 tractor designed by Pacific Intermountain Express Co. Twenty are already on order. Company says these features are improvements:

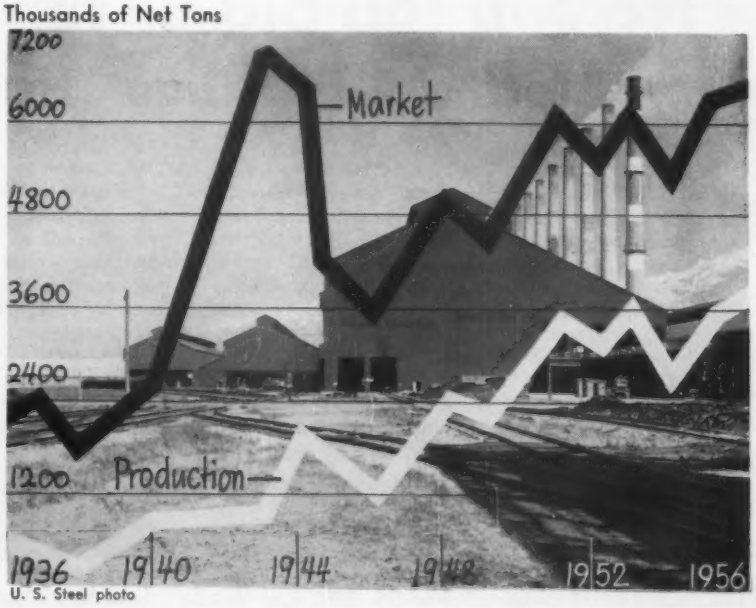
(1) Steering apparatus made up of two sets of front wheels on tandem axles. Gives safety and ease of steering.

(2) Diesel engine placed like a pancake, on its side, beneath the chassis, about midship. Eliminates fumes and vibrations, and reduces noise in cab.

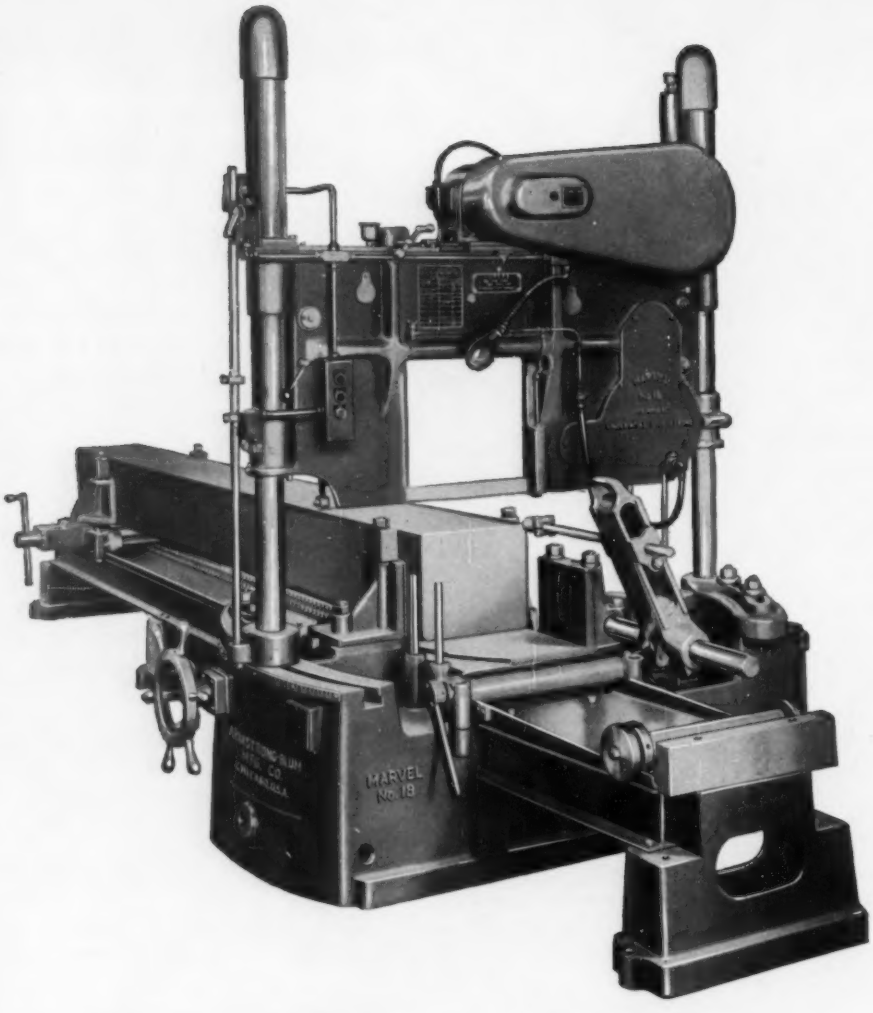
(3) Air suspension springs in place of conventional steel springs. Makes easier riding.

(4) Broad windshield. Gives the driver a much wider field of vision for safer driving.

## Why West Needs More Steel



U. S. Steel photo




# No Job too big or too tough . . .

## for MARVEL "*Giant*" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18" x 18"; and No. 24, Capacity 24" x 24") were *basically* designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

*Write for Catalog*

MARVEL *Metal Cutting* SAWS
Better Machines-Better Blades

**ARMSTRONG-BLUM MFG. CO.** 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

MACHINE TOOL HIGH SPOTS

# Future Design Will Feature Simplicity

**Industrial designer tells Cincinnati celebration future machine tools will be simpler in form, operation, maintenance . . . New orders, shipments of metal cutting tools rise—*By E. J. Egan Jr.***

◆ PROMINENT INDUSTRIAL designer Raymond F. Loewy believes that simplification will be the prominent consideration and characteristic in the form, operation and maintenance of products of the future.

Design non-essentials will be eliminated, as well as dirt-catching recesses and dangerous asperities.

Other design goals, according to Mr. Loewy: silent operation, elimination of vibration, smooth acceleration and deceleration. "We will fight against breakdowns . . . by designing more carefully the apparently insignificant component which is responsible. All parts . . . must be easily accessible for replacement or repair . . . loading or starting should be effortless."

**Celebration** . . . Occasion was the recent Panorama of Progress held on the University of Cincinnati campus. Eleven machine tool builders were prominent among the 75 industry exhibitors. The displays were part of a week-long celebration commemorating the 50th anniversary of the University's cooperative education program.

Festivities also honored the late Herman Schneider, who, as dean of the University's Engineering College in 1906, originated the co-op plan of alternate work and study.

**Others** . . . The project was backed by a national sponsoring committee headed by Frederick V. Geier, president of Cincinnati Milling Machine Co. The thousands of visitors heard a number of other industrial speakers in addition to Raymond Loewy speak on the theme "Education and Industry at Work for Progress."

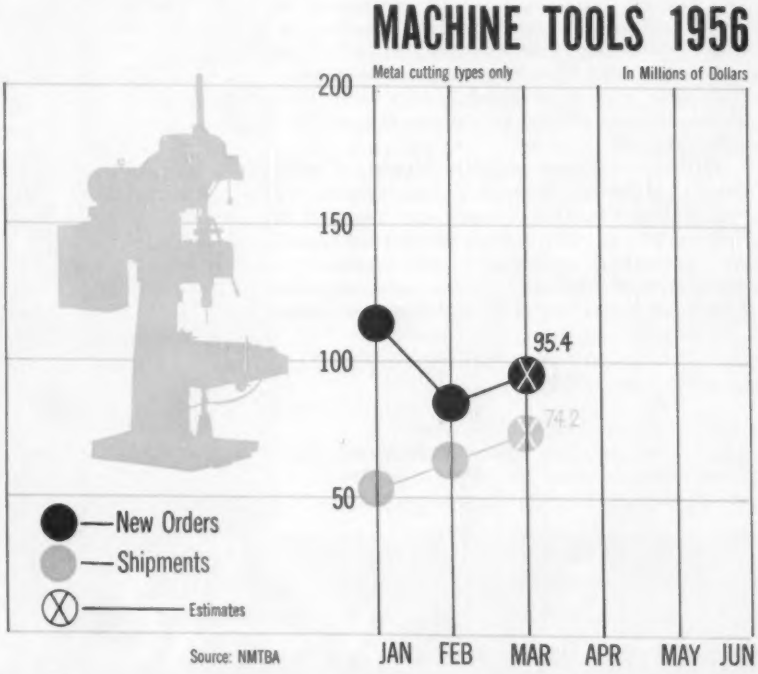
**Electronic techniques** . . . Mervin J. Kelly, president of Bell Telephone Laboratories, spoke of progress in electronic techniques for controls and record keeping. These systems transform or code information into a common digital language which is expressed electronically.

"Thus," Kelly said, "machines some day will talk to machines in the same fashion that people now converse by telephone."

## Orders Up

New orders for metal cutting machine tools totaled an estimated $95.4 million in March, increase of 10.8 pct over February figure of $86.1 million. March shipments rose to $74.2 million compared with the February total of $64.6 million. Gain here was 14.8 pct.

On a quarterly basis, new orders for the first three months of this year add up to $296.7 million, 60 pct ahead of the $185.4 million for the like 1955 period. Shipments of $193.4 million for the initial 1956 quarter are 21 pct higher than the $159.2 million registered in the comparable period last year.



# Announcing

# TWO GREAT EVENTS FOR MAY 17TH

## THE CONSOLIDATION OF THREE GREAT COMPANIES

acf Valve Division, W-K-M Manufacturing Company, Inc., and the Key Company — all members of the acf Industrial Family — have been brought together as W-K-M Manufacturing Company, a subsidiary of acf Industries, Inc.

Management, Manufacturing and Marketing facilities of all three are now centralized in this new 12-acre completely air-conditioned office and plant at Missouri City, Texas, a few miles west of Houston.

This consolidation provides important efficiencies of production of W-K-M Through-Conduit Valves, acf Lubricated Plug Valves, Key Return Bends, and Key-Kast Welding Fittings. These products, with a long established reputation for excellent service and performance, will continue to be engineered, manufactured and sold by the same experienced personnel who were instrumental in building that reputation.

## OPENING OF A GREAT NEW PLANT THURSDAY, MAY 17TH TWO to SEVEN P. M.

You are cordially invited to inspect our new Plant and Office at Missouri City, Texas, just a few miles west of Houston.

Special transportation from downtown Houston to the plant will be provided for visitors. Please write immediately for your Transportation Pass. Address W-K-M Manufacturing Company, Guest Committee, P. O. Box 2117, Houston, Texas.

**W-K-M MANUFACTURING COMPANY, INC.**

A SUBSIDIARY OF acf INDUSTRIES INCORPORATED

PLANT: MISSOURI CITY, TEXAS • MAILING ADDRESS: P. O. BOX 2117, HOUSTON, TEXAS

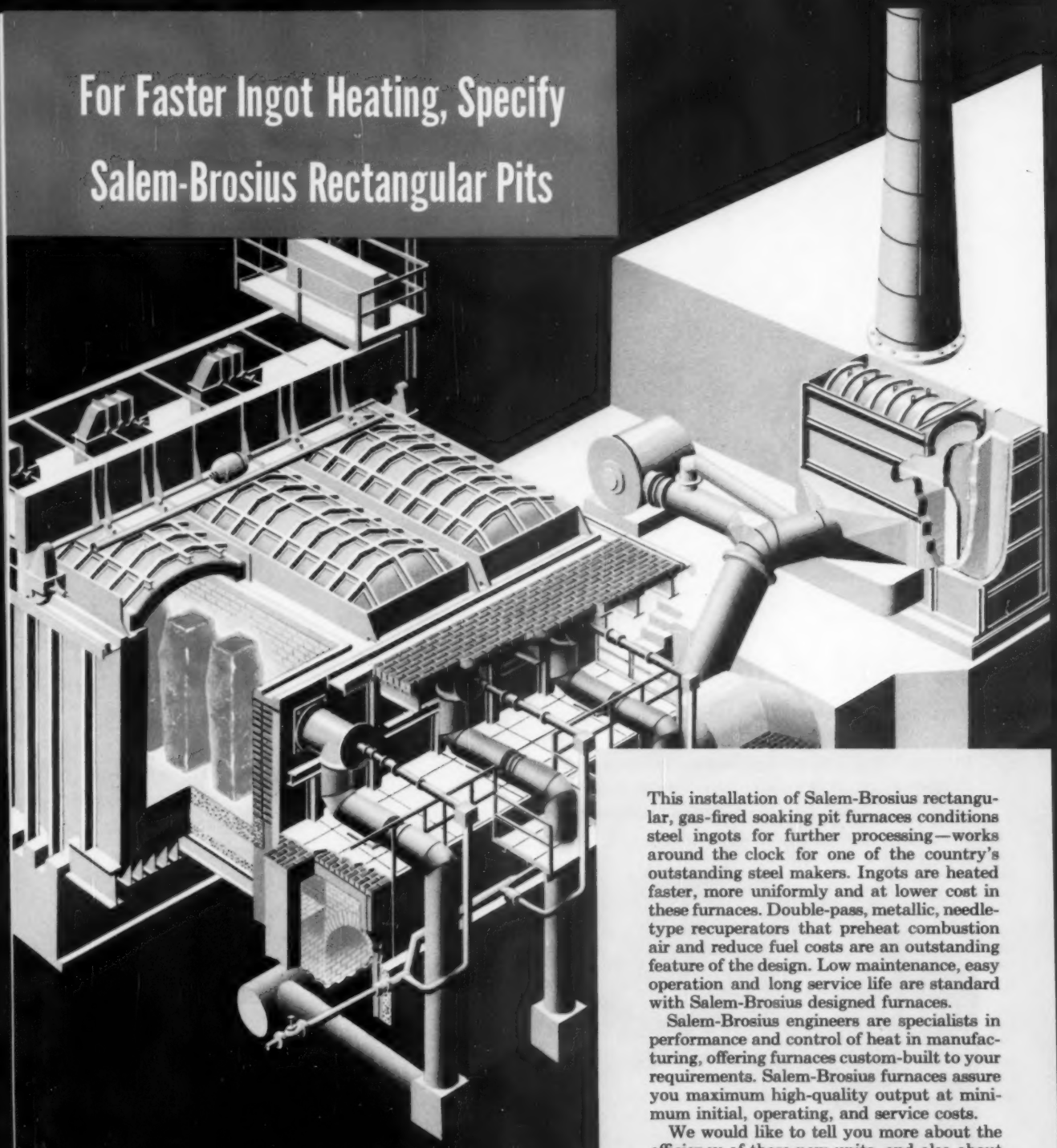
*MANUFACTURING*

**W-K-M THROUGH-CONDUIT GATE VALVES**

**acf LUBRICATED PLUG VALVES**

**KEY RETURN BENDS AND FITTINGS**

# For Faster Ingot Heating, Specify Salem-Brosius Rectangular Pits



This installation of Salem-Brosius rectangular, gas-fired soaking pit furnaces conditions steel ingots for further processing—works around the clock for one of the country's outstanding steel makers. Ingots are heated faster, more uniformly and at lower cost in these furnaces. Double-pass, metallic, needle-type recuperators that preheat combustion air and reduce fuel costs are an outstanding feature of the design. Low maintenance, easy operation and long service life are standard with Salem-Brosius designed furnaces.

Salem-Brosius engineers are specialists in performance and control of heat in manufacturing, offering furnaces custom-built to your requirements. Salem-Brosius furnaces assure you maximum high-quality output at minimum initial, operating, and service costs.

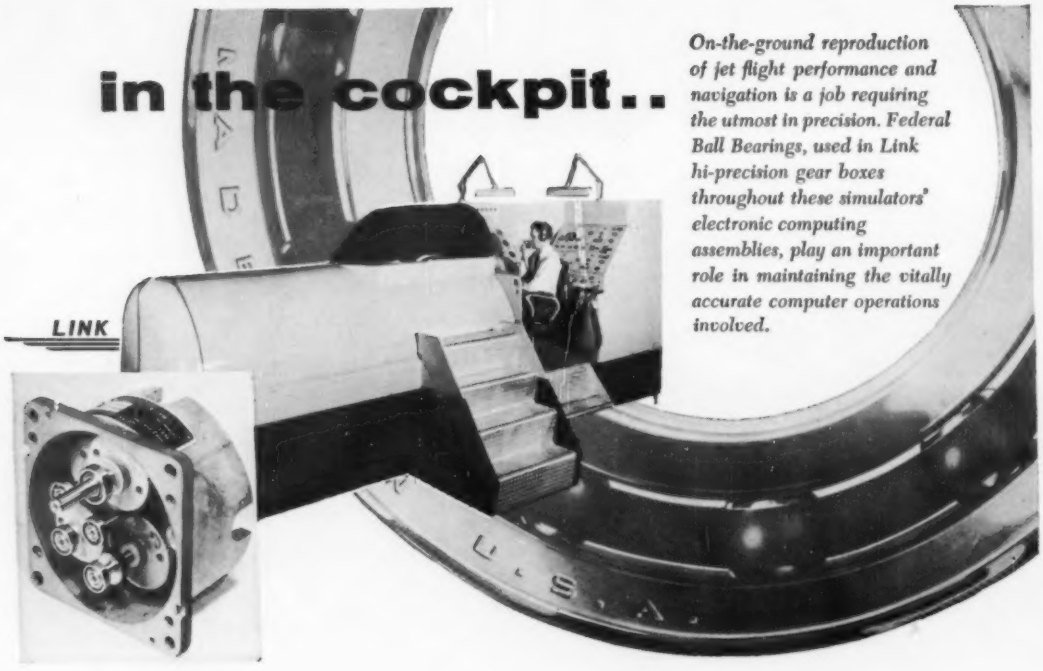
We would like to tell you more about the efficiency of these new units, and also about the well-known Salem-Brosius circular soaking pits.

If your modernization or expansion plans call for heating or heat treating furnaces of any kind, write, wire, or phone Salem-Brosius.

# SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

IN CANADA: SALEM ENGINEERING LTD. · 1525 BLOOR STREET WEST, TORONTO 9, ONTARIO




*On-the-ground reproduction of jet flight performance and navigation is a job requiring the utmost in precision. Federal Ball Bearings, used in Link hi-precision gear boxes throughout these simulators' electronic computing assemblies, play an important role in maintaining the vitally accurate computer operations involved.*

# so much of industry *turns* on FEDERAL ball bearings

From trainers for pilots to tractors for ploughs—in home, office, machine shop—wherever you find mobility—you'll find Federal Ball Bearings helping to keep things moving. Hundreds of types—more than 12,000 sizes! And all produced by a company that has devoted 50 years to the manufacture of ball bearings . . . exclusively.

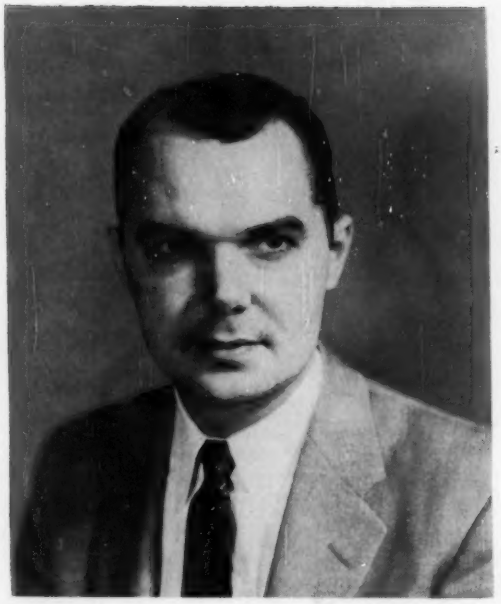
When Federal Ball Bearings are part of so many things you *use*, shouldn't they be part of the things you *make*?

**THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.**

*Do you have FEDERAL'S NEW CATALOG? 175 pages of ball bearing and engineering data. Just drop us a line and we'll speed you a copy.*

*Less glamorous, perhaps, than jet flight simulators—but as essential as the food they help cultivate—are these rugged, hard-working, dependable tractors. And ruggedly reliable Federal Ball Bearings are here, too.*

**Federal**
**BALL BEARINGS**
One of America's Largest Ball Bearing Manufacturers



## The Iron Age

# SALUTES

### *J. Nelson Grace*

**One of the nation's top atomic scientists, he heads up analytical section of advanced nuclear development for Westinghouse. But he still finds time to tinker, enjoy ordinary things.**

Dr. J. Nelson Grace likes to rebuild old cars and play the piano. He does home repairs, works on the lawn, is active in Boy Scout affairs. His secretary has never seen him mad or even impatient.

These ordinary points are of interest because Dr. Grace is not an ordinary man. He's an atomic scientist. At 31, he directs the analytical section of the advanced development group at the Westinghouse Bettis atomic research installation. He works on nuclear design, hydraulics, dynamic analysis and control. He has lectured at Carnegie Tech and University of Pittsburgh, is now teaching reactor plant dynamics to a group of crack nuclear engineers.

Dr. Grace is one of the men who are leading the way into the nuclear age. He works with forces the average person can't begin to understand but which promise to change the lives of millions. Because of the importance of his work and because nuclear pronouncements must be taken on faith, it's a little reassuring to learn that he comes home to tinker with cars and dig up weeds. His well-balanced outlook was noted in a recent citation by Eta Kappa Nu, the scholastic honorary fraternity for electrical engineers. The society commended Dr. Grace for civic as well as technical and professional achievements.

Another point of general interest is the direction of Dr. Grace's studies. Many people have expressed fears that widespread use of nuclear power would leave the country open to fearful catastrophes. What happens, they ask, when a reactor runs wild? Dr. Grace has shown an awareness of this problem. He has written several papers on nuclear reactor stability and control. He co-authored an article telling how ordinary characteristics like temperature and pressure could be used to control pressurized water reactors. Previously, neutron measurements had been considered necessary.

Dr. Grace enrolled in Carnegie Tech after three years' service with the Air Force. He received his bachelor of science degree in 1949 and his doctor of science degree in 1951. That year, he joined Westinghouse.

Fruehauf builds these Volume Van trailers from Crucible stainless assemblies fabricated by The Budd Company.

# how STAINLESS adds payload capacity—lowers costs

Cargo capacity and profits go hand-in-hand in the transportation field. And stainless steel's high-strength gives this Fruehauf *Volume Van* trailer construction advantages that add up to carrying capacity above that of other van type trailers.

Stainless steel provides extreme rigidity and toughness, yet reduces dimensions of side walls, roof tension sheets, and front and rear panels. As Fruehauf says:

*"Not only is there a gain in cubic capacity as well as strength, but an actual saving in weight so that the net result of the complete design is a transportation unit which will provide the highest possible return on the initial investment."*

And stainless lasts indefinitely. In fact, there's a tradition in the industry that "no stainless steel trailer has ever worn out." For stainless resists wear, fights corrosion, takes a lot of punishment before it will scratch or dent. Maintenance is greatly reduced.

**Should your product use stainless?** It may be the answer to greater efficiency, lower costs, a more attractive product for you, too. Ask your local Crucible representative, or write *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

**CRUCIBLE** first name in special purpose steels

**Crucible Steel Company of America**

Canadian Distributor — Railway & Power Engineering Corp., Ltd.

# The Iron Age INTRODUCES

**T. J. Phillips**, elected president and director, **Alloy Steels, Inc.**, Detroit; **Herbert F. McHalpine**, elected vice president, sales.

**Charles L. Holbert**, named executive vice president and operating head, **H. K. Porter Co., Inc.**, New York.

**Roger A. Yoder**, named vice president, **Detroit Steel Corp.**, Detroit.

**A. B. Drastrup**, elected vice president, **Joy Manufacturing Co.**, Pittsburgh.

**Herbert H. Rogge**, named executive vice president, **American Car and Foundry Div.**, ACF Industries, Inc., New York.

**Martin Victor**, elected secretary, **The Babcock & Wilcox Co.**, New York.

**Paul A. Barkmeier**, named director, marketing services, **Borg-Warner Corp.**, Chicago.

**J. C. Evans**, elected controller, **Wagner Electric Corp.**, St. Louis, Mo.; **E. G. Holtzman**, elected secretary-treasurer; **J. P. Harbacek**, elected ass't secretary and ass't treasurer.

**Ivor Bryn**, elected executive vice president, **McLouth Steel Corp.**, Detroit; **L. E. Moultane**, elected executive vice president, sales and service; **Greyson D. Baldwin**, elected secretary and controller.

**Edward B. Washburn**, appointed finishing superintendent, **Waterbury Mfg. Co.**, Division of Chase Brass & Copper Co., Waterbury, Conn.

**Dick W. Pehl**, appointed superintendent, mechanical maintenance, **Kaiser Steel Corp.**, Fontana, Calif.

**William C. Campbell**, named manager, warehouse operations, **Joy Manufacturing Co.**, Pittsburgh.

**Joseph L. Lessman**, named plant manager, Foundry Div., **Cooper Alloy Corp.**, Hillside, N. J.; **Albert Reichers**, named plant manager, Stainless Engineering & Machine Works Div.

**Maurice K. Brown**, named general manager, sales, **Penn Metal Co., Inc.**, New York.

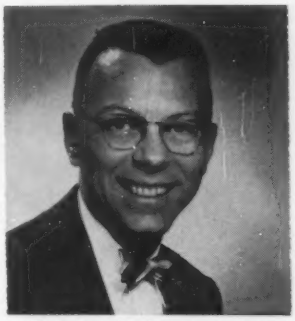
**Edward J. Stephenson**, named assistant sales manager, **Wheeling Corrugating Co.'s** New York branch.

**Douglas L. Heisler**, appointed purchasing manager, Harrison Div., **Worthington Corp.**, Harrison, N. J.

**J. W. Bramley**, named district sales manager, Boston office, Tubular Products Div., **The Babcock & Wilcox Co.**, Beaver Falls, Pa.; **Robert C. Garvey**, named assistant district sales manager, San Francisco office, Tubular Products Div.

AMBROSE J. WARDLE, JR., elected president, McKay Machine Co., Youngstown, O.

WILLIAM K. LOMBARD, elected vice president and sales manager, Thermal Research & Engineering Corp., Conshohocken, Pa.



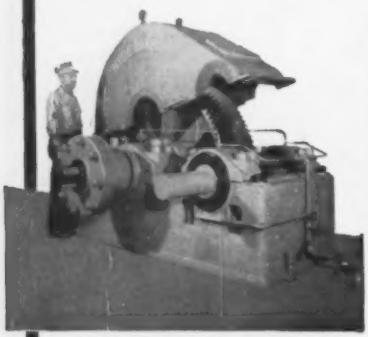
ROBERT G. KELLER, named chief engineer, Machine Div., Lewis Welding & Engineering Corp., Euclid, O.

JOHN R. BOHNE, appointed director, Industrial relations, The Youngstown Sheet and Tube Co., Youngstown, O.

Hyde Park
RED CIRCLE Rolls ALLOY-CHILLED

Gray Iron Castings

Hyde Park Castings up to 80,000 pounds are sound, accurate and physically dependable.
Precision machining is done by skilled craftsmen in our modern machine shop.
Send your blue prints for quotation.



Mill Drive

Machine Castings
Lathe Beds
Housings
Pinion Housings
Mill Housings
Shoe Plates
Layout Plates
Surface Plates

For finer finish, long life and greater tonnage, specify Red Circle Rolls.

Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

**Edwin A. Schulte,** appointed controller and assistant treasurer, **Curtis Manufacturing Co.,** St. Louis; **Edward O. Gotway,** appointed chief purchasing agent.

**Rudolf G. Quitmeyer,** named comptroller, Defense Operations Div., **Chrysler Corp.,** Detroit.

**Harry S. Weiss,** appointed manager, Steel Warehouse Div., **Fabricated Steel Service, Inc.,** North Hollywood, Calif.

**Anthony Meola,** named manager, quality control, **Monroe Calculating Machine Co.,** Orange, N. J.

**A. O. Willis,** named manager, manufacturing, **National-U. S. Radiator Corp.,** Johnstown, Pa.

**Richard S. Ralph,** named general sales manager, **Turner Brass Works,** Sycamore, Ill.

**Robert W. Powell,** named general sales manager, **The Fafnir Bearing Co.,** New Britain, Conn.

**Richard J. Howlett,** named plant manager, Buick-Oldsmobile-Pontiac Assembly Div., **General Motors plant,** Atlanta, Ga.

**William H. Eutzy,** named manager, production control, Television-radio Div., **Westinghouse Electric Corp.,** Metuchen, N. J.

Following appointments are within the Engine Div., **Chrysler Corp.,** Detroit: **Milton E. Trueman,** named plant manager, Mound Road engine plant: **J. F. Anderson,** named manager, production engineering; **Howard W. Hunt,** named comptroller; **Donald R. Kinker,** named divisional chief engineer; **Marvin G. Simmons,** named purchasing supervisor; **Harry R. Bently,** named manager, production planning; **John P. Horgan,** named manager, administration and organization; **Robert J. Stevens,** named manager, industrial relations.

**Juston D. Williamson,** named sales manager, **General Pipe and Supply Co., Inc.,** Compton, Calif.

E. L. MILLER, appointed assistant general manager, The Cooper-Bessemer Corp., Mt. Vernon, O.

SHERMAN R. LYLE, named district manager Steel and Tube Div. Cleveland, The Timken Roller Bearing Co.

W. GRAHAM HALL, named sales manager, Los Angeles district, Armco Steel Corp., Middletown, O.

JOHN R. WALL, named assistant general traffic manager, Republic Steel Corp., Cleveland.

# HANDLES MORE STEEL AT LOWER COST!

At Lehigh Structural Steel, a 25-ton American DiesELectric* Locomotive Crane performs numerous steel handling jobs at profitable speeds and lower cost! Typical uses include unloading incoming steel, loading outbound fabricated steel and doing various materials handling jobs around the firm's Allentown, Pa., plant. A special use of their DiesELectric—one that demonstrates the precision of American's air controls — involves check-fitting Lehigh fabricated structural steel towers. This operation calls for movements as small as ¼-inch to bring heavy steel members into alignment — a task that sensitive, responsive air controls make routine! High boom jobs are frequent at Lehigh, too, and American's skywide visibility keeps the boom tip in sight at all times!

Across the country, manufacturers, processors and distributors of heavy metal products have discovered that fast, efficient, trouble-free Americans pay for themselves in a hurry! For detailed specifications on 25 to 80-ton American DiesELectric Locomotive Cranes, write:

## AMERICAN HOIST
### and Derrick Company
**St. Paul 1, Minnesota**

*Registered Trade Mark

Diesel-Electric Locomotive Crane U.S. Patent No. 2083460, Canadian Patent No. 368226 and Touch Control U.S. Patent No. 2370859 Granted to American Hoist and Derrick Co.

NEW OAKITE CLEANERS
GIVE YOU MORE FOR YOUR
PAINT-PREPARATION DOLLAR

# Here are 4 ways to end pre-paint metal-cleaning troubles

Does your trouble chart show that you need better cleaners, strippers or surface conditioners?

- ☐ Cleaning solution foams excessively in spray washing machine. See 1 below.
- ☐ Streaky discolorations or powdery residues cling to surface of steel parts being stripped for repainting. See 2.
- ☐ Zinc phosphating process too difficult to control . . . Iron phosphating process doesn't show good results in salt spray tests. See 3.
- ☐ Too many operations—cleaning, pickling, neutralizing, etc.—are needed to prepare steel that does not require phosphating before painting. See 4.

Here are brief descriptions of new Oakite materials designed to end these particular troubles:

1. For a spray washing solution that does not foam at high pressure, try Oakite Composition No. 161. Does not attack aluminum.
2. For stripping pigmented paint, phosphate coatings and undercoat rust *in one operation*, try Oakite Rustripper.
3. For a zinc phosphating process that is truly easy to control, try new Oakite CrysCoat SW . . . For salt spray results far beyond the capacity of ordinary phosphating processes, try new Oakite CrysCoat No. 89.
4. For *one-operation* removal of rust, heat scale, welding residues and light soil together with good preparation for painting, try Oakite Compound No. 131. Inhibited against attack on steel.

**FREE** Check the coupon and we will send you free booklets or bulletins with full information on new Oakite cleaners.

OAKITE

OAKITE PRODUCTS, INC.
30H Rector Street, New York 6, N. Y.

Send me free booklets or bulletins giving complete information on the new Oakite materials checked below:

- ☐ Oakite Composition No. 161
- ☐ Oakite Rustripper
- ☐ Oakite CrysCoat SW
- ☐ Oakite CrysCoat No. 89
- ☐ Oakite Compound No. 131

NAME_____

COMPANY_____

ADDRESS_____

## PERSONNEL

**George Wulff,** named district sales manager, Oregon, Delta Power Tool Div., **Rockwell Manufacturing Co.,** Pittsburgh; **Anthony C. Auk,** named district sales manager, Eastern Michigan, Delta Power Tool Div.

**John J. Mayne,** joins New York district sales office, **Penn Metal Co., Inc.,** New York.

**Vincent Meyer,** named assistant division engineer, coated abrasives, **Minnesota Mining & Manufacturing Co.,** St. Paul, Minn.; **F. Lindsay Power,** named divisional engineer, coated abrasives.

**Harold Ray,** named sales representative, Philadelphia district sales office, **Sharon Steel Corp.,** Sharon, Pa.; **Raymond Emery,** appointed to Sharon district sales office; **Donald Meyer,** named to position, Customer Service Dept.

**Perce Cunningham,** appointed general plant manager, **Hawthorne Metal Products Co.,** Royal Oak, Mich.

**John G. DeNardin,** named sales representative, Indianapolis, Ind., office, **Mueller Brass Co.,** Port Huron, Mich.; **Richard J. Williams,** named sales representative, Dallas, Tex.; **George I. Duddy,** named sales representative, Cincinnati office; **William A. Preininger,** named district manager, Denver, Colo.

**T. E. Brady,** appointed ceramic engineer, **Surface Combustion Corp.,** Toledo, O.

**John L. Whiteman,** named manager, Technical Advertising and Data Dept., **Jack & Heintz, Inc.,** Cleveland.

## OBITUARIES

**James Paul Lawrence,** 66, chairman of the board, **American Monorail Co.,** Cleveland.

**Harry C. Lehne,** sales representative, **Joseph T. Ryerson & Son, Inc.,** Philadelphia plant.

# Tools made of modern

# High Speed Steels

and will do thousands of
cutting and forming operations
more economically than carbides

**next time specify** tools made of High Speed Steels

—and for first quality High Speed Steels
remember these brand names:

- Vasco Supreme
- Vasco M-2
- 8-N-2
- Red Cut Superior
- Red Cut Cobalt
- Neatro
- Van-Lom
- Van Cut
- E. V. M.
- Gray Cut Cobalt

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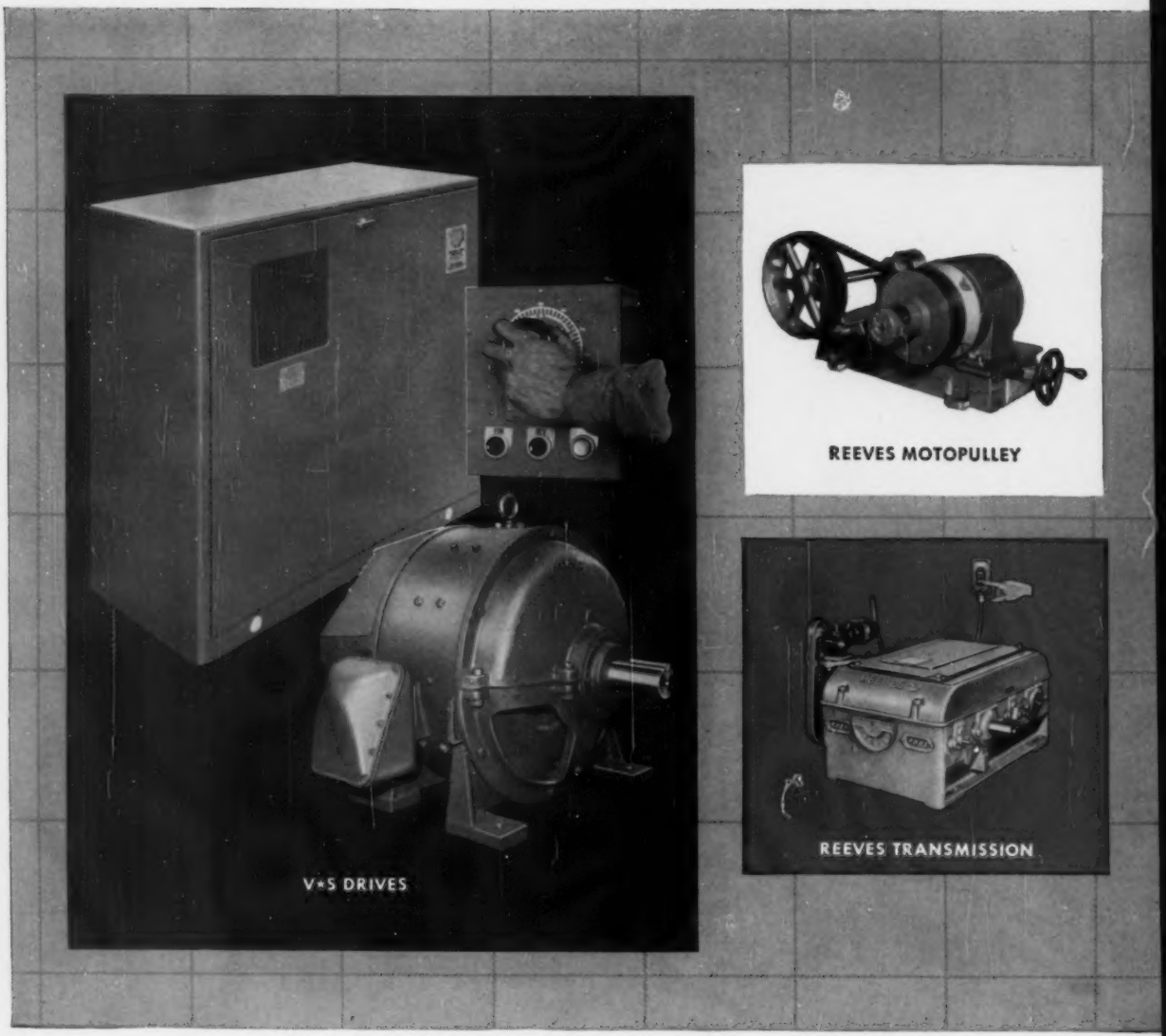


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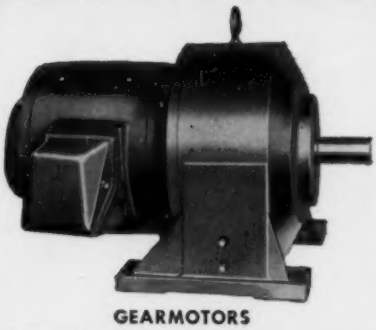

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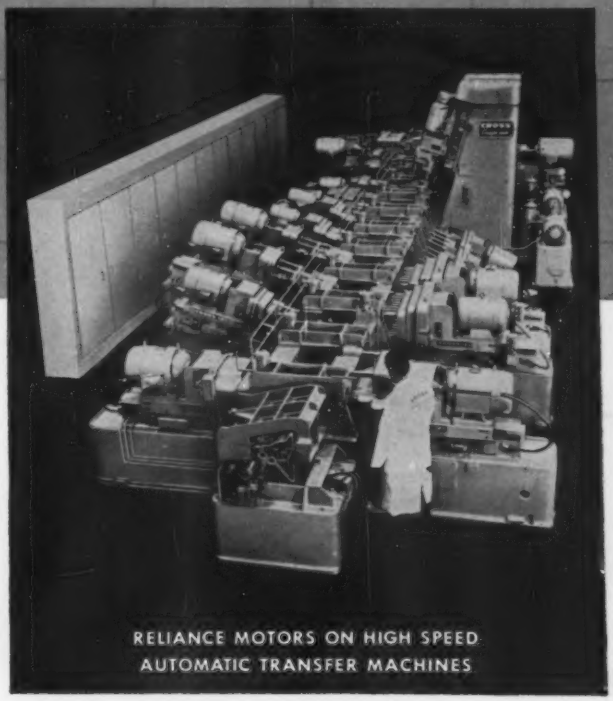

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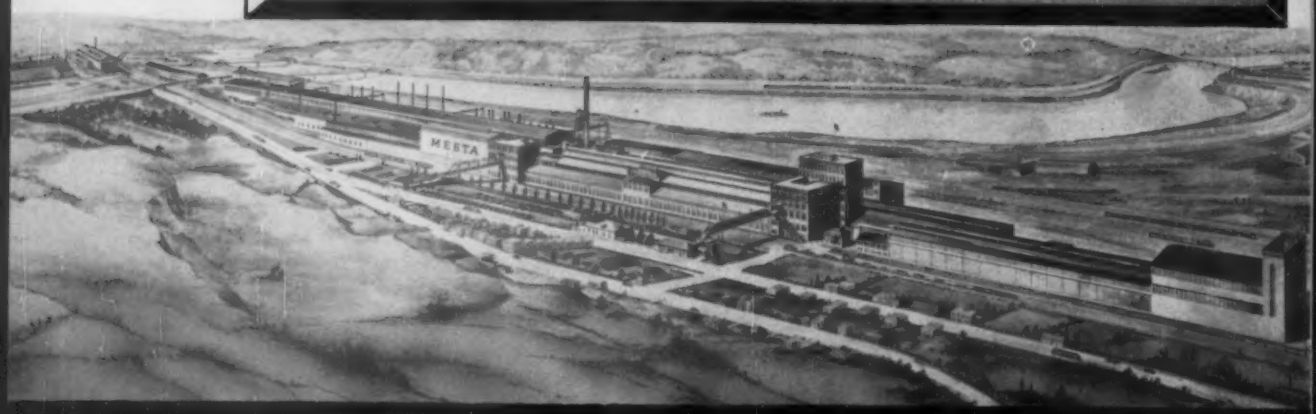


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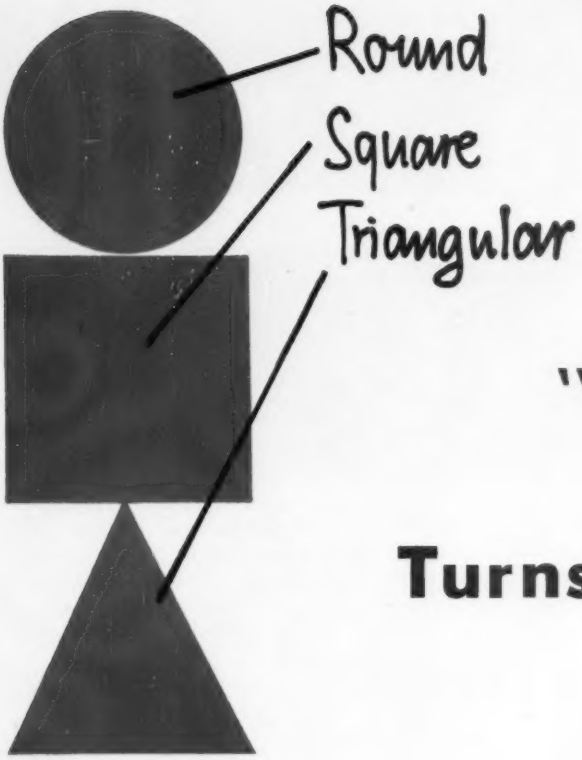



Machines any metal—

# "Throwaway" Ceramic Turns New Profits From Old Lathes

◆ Do you have to wait for super-rigid, ultra-powered machine tools before you can use ceramic tools to your profit advantage? . . . Not any longer . . . One of the newest types aims for widespread use right now on conventional lathes.

◆ Hard enough to cut anything but a diamond, this product comes in round, square and triangular "throwaway" blanks . . . Supplied in a single grade and used in special tool holders, they switch from rough cuts to finishing cuts with ease.

By E. J. EGAN, JR., Machinery Editor

◆ HOW WOULD YOU like to use a throwaway type of lathe turning tool that will:

1. Machine any metal you apply it to—from free-cutting brass or aluminum to the hardest, toughest alloys?

2. Rough turn a workpiece (even with an interrupted cut) and then produce something like a 15 microinch finish—and do both jobs with the same cutting edge?

3. Work at peak efficiency without a coolant?

4. When worn, be cheap enough to throw away without regrinding, and without concern for the cost?

5. Be usable on most lathes right now, regardless of their age, speed or power capacity, or the fact that their spindle bearings might be somewhat sloppy?

Startling as these claims may sound, there is a new type of cutting material that seems well on its way toward fulfilling them. It's a member of the ceramic tool family, but it acknowledges only a "shirt-tail" relationship with rival products insofar as basic structure is concerned.

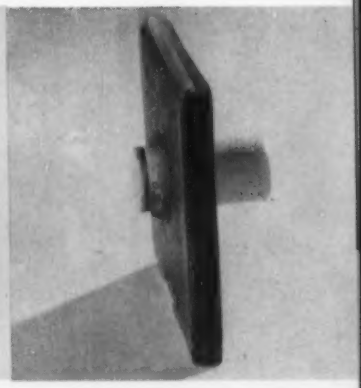
HOLDERS for round insert (top) and square insert (bottom) give blanks rigid support without use of extra clamps or pads.

Name of the new product is Sintox, derived from the fact that it is primarily a sintered aluminum oxide. It is produced in England, although its cutting tool applications and sales in the U. S. are engineered by the Sintox Corp. of America, Allentown, Pa.

What metals will this almost-diamond-hard material machine? All of them, apparently. Tests on dozens of alloys used commercially, including stainless steel and titanium, have been completely successful. Experiments even included a "mystery metal," brought in by a representative of the military with the comment: "If you can machine this stuff, you can machine anything." The job was done, and at several speed and feed combinations.

Visual evidence of the ceramic tool's versatility is scattered all over the Allentown test-demonstration shop. Benches are loaded with step-turned rods, billets and castings of various metals. Many show the results of using a single insert tool to first take cuts as deep as the exposed portion of the tool tip, and then to produce threadlike turnings from a cut only 0.00025-in. deep. Moreover, such cuts are made at speeds and feeds that range from conventional combinations to those attained only on ultra-modern equipment.

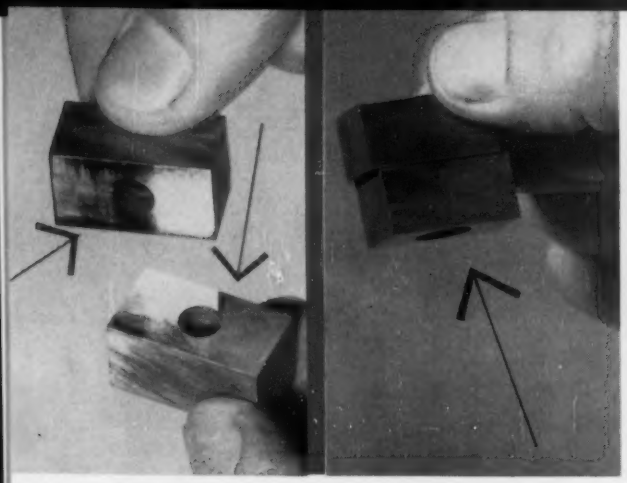
One sample shown is a cast cylindrical billet of nodular iron, full of porosity. The ceramic tool did expose fresh cavaties as it skimmed along, but it didn't drag or smear the surface. Nearby is a bar of alloy steel, heat treated to Rc 65 hardness, on which a single, mechanically-held, throwaway insert eased its way from a roughing cut to one that produced a mirror-like finish.

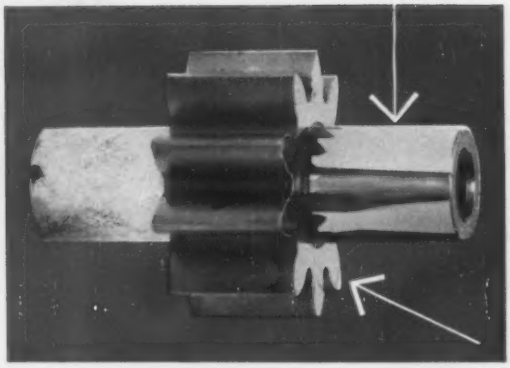


EXCEPTIONAL compressive strength of ceramic is demonstrated by its unmarked condition after being pushed through a piece of boiler plate.

Average witness to these demonstrations is surprised to note that the lathe doing all of this work is not even bolted to the floor. Most reports on ceramic cutting tools stress the fact that because they are brittle, they must be used on exceptionally rigid machine tools.

But absolute machine rigidity isn't required





Above and Right: **SAME ceramic grade that takes deep roughing cuts faces hardened high speed steel blocks so that they will "wring" together, and also puts a burnished mirror surface on part of the shaft and one face of a steel gear.**

with this new material. In fact, the demonstration lathe is deliberately left on its wooden shipping skid to prove this point. And the operator will add weight to the argument by chucking a test piece slightly off center to simulate a worn spindle bearing condition, and then proceed to machine the job with ease.

Announced goal of these demonstrations is to prove that Sintox is not just another ceramic tool aimed for the future, when machine tools will be faster and more vibration-free than they are today. The material is ready right now for efficient, economical machining on present-day metals—and with the average type of equipment that most plants have on hand. A firm doesn't need special, "souped-up" lathes to use it.

A pet slogan around the Allentown offices and shop is that the material "is as cheap as dirt." Explanation is that aluminum oxide is abundantly available as a non-strategic mineral. For this reason, company representatives say that, "if the new ceramic is properly applied, it should cost only about one-third as much as conventional cutting tools in terms of the volume of metal removed."

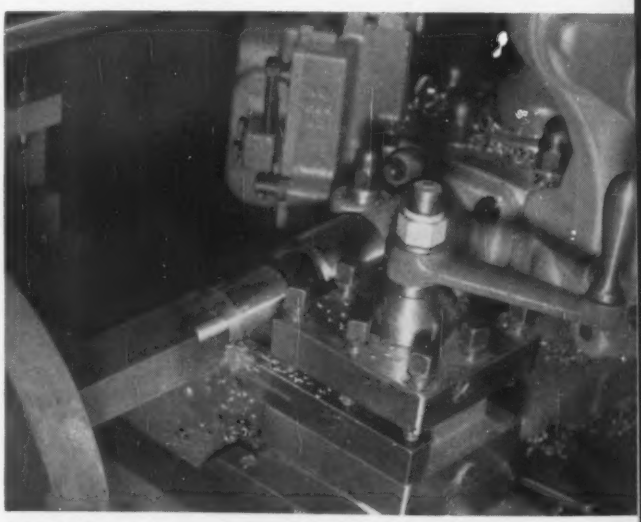
Basis for this economy-in-use theory is that since most of the multiple-edge, indexable ceramic inserts cost less than a dollar apiece, it is cheaper to replace them than to regrind them. Moreover, where these mechanically-held tips can be used, they are more economical than blanks that are brazed to a shank.

Another cost-saving item is the fact that the ceramic comes in just one grade. This simplifies tool inventory problems, and eliminates any chance for grading mixups that might result in excessive tool expense or spoiled work.

The universal grade consists substantially of aluminum oxide with a minimum amount of silica. Fractional percentages of certain refractory oxides are added to improve the mechanical properties. In composition, the product is probably quite similar to many other ceramic products intended for machining metal.

But in one significant particular, it is radically different from other ceramic tools: No binder or cementing material is used to coat the fine-grained particles. Thus the final molded form, sintered at a very high temperature, is said to be a product of "intermolecular fusion." Theory is that this creates a more homogeneous structure with less of the customary "ceramic brittleness."

Result is a non-porous material with a satiny-smooth surface, a pink color, and a hardness somewhere between that of a sapphire and a diamond. Mechanical hardness tests can't be used to give the ceramic a precise spot on any of the conventional scales. The material does not yield gradually to the usual indenters; it



**SQUARE insert of ceramic material makes an interrupted cut on a hexagonal bar of 4140 steel.**

**Potential of the ceramic depends heavily on its use with special tool holders.**

chips away in an irregular, unmeasurable cavity when sufficient pressure is applied.

This tendency to chip-out under pressure has been a major deterrent to the widespread use of most ceramic tools thus far. And although Sintox, because of its particular fused structure, is said to be less brittle than other types, this characteristic did delay its practical use as a cutting tool for several years.

In fact, much of its present potential for fast, low-cost metal removal depends on its use only in conjunction with specially-designed tool holders. (Brazing, although a practical method for mounting metallized Sintox tips, is not considered as economical or efficient as the present clamping technique.)

Design of the special tool holder is calculated to take full advantage of the compressive strength of the ceramic, which is close to 500,000 psi. At the same time, the holder supports the cutting edge of the insert so firmly that the tool can make interrupted cuts and also withstand unusual amounts of chatter and machine vibration. This is done without the use of a pad under the insert or a clamp on top of it.

Key to the tool holder's ability to fully exploit the ceramic's properties are the slots machined into the top and sides of the shank. Hex-head socket screws pass through the holder in such a manner that, when tightened, they tend to narrow the slot openings. The action can be likened to the closing of vise jaws. It effectively wedge-grips and preloads the insert in conformance with carefully-plotted tool geometry.

### Round tips do heavy turning

Round insert tips are recommended for heavy duty turning and facing operations. They are available in either a plain style with flush, parallel ends, or a chipbreaker design which has a raised circular boss molded on each end. These tools can be rotated any increment of the full circle if edge chipping makes it necessary to present a fresh cutting surface to the work. Whenever one end of the bit is too badly chipped for further use, the opposite end affords another 360° of cutting edge.

Square inserts (with a total of eight cutting edges) are available for general purpose turning and facing, and are used with tool holders that have a 15° approach angle built-in. The inserts are supplied in three forms: (1) plain, (2) with chipbreaker, (3) with chip control groove.

For turning and facing work square to a shoulder, triangular inserts are used in tool holders designed for this shape. These tips are also furnished in both plain and molded-in chipbreaker forms.

Having a maximum number of cutting edges on the inserts is an important economy item. So is the fact that they come ready to use and require no preliminary grinding.

Although prolonged machining fails to produce any noticeable edge or flank wear on an insert tip, some spoilage due to chipping-out in back of the cutting edge can be expected. But the low cost of the inserts minimizes this problem, as does the fact that a new cutting edge can be indexed into position quickly and easily.

### No coolant needed

Chipping of these tools occurs simply because of excessive pressure in the wrong place at the wrong time. It can result from (1) chips building up in back of the cutting edge instead of falling free, (2) improper positioning of the tool with respect to the centerline of the workpiece.

However, since the ceramic tip cuts without a coolant, there is no alternate heating and cooling action that could conceivably crack the tool. In fact, most of the heat generated at the tool-chip interface is transferred to the chip. As with other ceramic tools, the insert is comfortable to the touch almost immediately after it is removed from the work.

Although chipping will spoil the cutting edge, its frequency will diminish as a machine operator becomes more familiar with the action of the ceramic tool on his work. It follows that each job requires study and trial to arrive at an optimum cutting condition.

A spokesman for the firm also says that despite its record of success to date, he cannot advocate the ceramic as a cure-all for any and every tough turning job. "When you take that stand," he says, "that's the day someone comes up with a problem that knocks you off your perch." He does admit, however, that they have not yet found a carbide turning job that the new low-cost ceramic tool couldn't handle.

What future does the firm see for this product —beyond present claims for its ability to rough and finish turn on conventional equipment at minimum cost per part produced?

One forward step already demonstrated: The ceramic will burnish a mirror finish on metals, as shown in accompanying photographs. Also in the development stage are such items as milling cutters, boring tools and drills.

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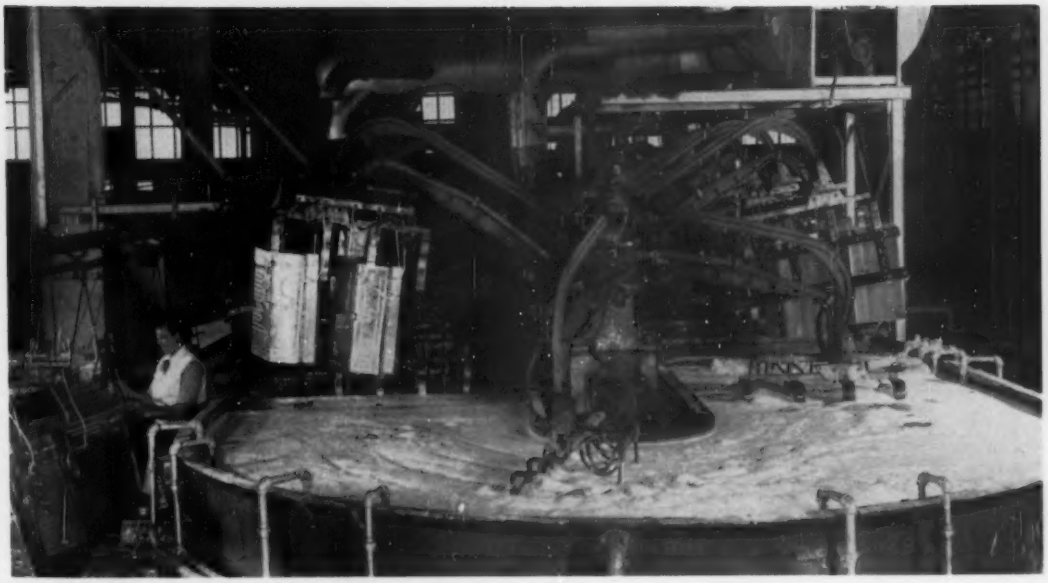


CONTINUOUS automatic anodizing unit can apply any color to these refrigerator evaporators.

**Techniques multiply fast—**

# Anodized Aluminum: Rainbow Hues Have "Pot-o'-Gold" Future

**◆ Experts predict a bright future for anodized aluminum . . . Rash of new developments adds weight to these opinions . . . Automobiles, trains, buses, appliances, housewares, buildings find new customer appeal in bright colored components.**

**◆ But color isn't the whole story . . . New anodizing techniques create finishes that are more resistant to heat, erosion and corrosion . . . Witness the growing use of anodized parts in critical applications where color doesn't count.**

By W G. PATTON, Engineering Editor

◆ GIVE lightweight, easily fabricated aluminum an anodizing treatment and you can increase both its sales appeal and its resistance to wear, erosion and corrosion. These are the reasons why many observers feel the applications for anodized aluminum will increase tremendously during the next few years.

There will be plenty of competition from other comparatively low - cost, attractive, scratch-resistant and chip-proof metal finishes. But recently announced developments and others well along in the laboratory justify predictions of a bright future for anodic coated forms of the light metal.

One rapidly growing field of use is in the automobile industry. There have been a number of applications on 1956 model cars and indications are that the list will be further ex-

## These Two Treatments Are Widely Accepted

| | CHROMIC ACID ANODIZING | SULFURIC ACID ANODIZING |
|---|---|---|
| COATING PRODUCED | Gray to greenish-gray impervious oxide film 0.00003 to 0.0001 in. thick. | Porous oxide film of various colors depending on the alloy. Thickness from 0.001 to 0.002 in. |
| PROPERTIES | Excellent corrosion resistance and paint base. Good abrasion resistance. Limited as mordant for dyes. | Corrosion and abrasion resistant base for paint. Excellent mordant for dyes. |
| COMMENTS | 1. Agitation by air or mechanical stirrer is desirable during processing.<br>2. May be used on assembled parts since entrapped acid has very little effect on corrosion. | 1. Suitable for all aluminum alloys.<br>2. Not acceptable on assembled or formed parts because of danger of corrosion by entrapped acid. |

tended for next year's designs. In particular, the use of anodized grilles, window frames, emblems, moldings and outside panels is expected in increase.

Several railroads, as well as the Pullman Co., use anodized aluminum hinges, berth ladders and seat frames. General Motors' new Aerotrain uses the material for exterior trim panels above the floor line, excepting only the window panels, which are painted. Similarly, large buses feature functional and decorative qualities of the treated metal.

### Appliances use more

Manufacturers of appliances and housewares are steadily increasing their use of anodized aluminum. For example, evaporators are now anodized to match the color styled interiors of refrigerators and freezers. And many housewives pay a handsome premium to buy cheese packed in color-anodized aluminum tumblers.

Exterior panels for apartment and office buildings are another field of use that is growing rapidly. Blue, gold, gray, black and brown are the colors most used at present, but other light-fast hues are in the development stage.

Aside from color considerations, anodically coated aluminum alloys are of universal interest to the aircraft industry. They offer a light metal with a hard, wear-resistant finish as a replacement for parts formerly produced from hard but heavy materials. And they are being used for such components as gears, rotor disks, pinions, manifold sections, gun blast tubes, slides and helicopter blade edges.

Erosion-resistant properties of the anodic coatings also make them useful in blower impellers, and for high velocity pumps.

Because of its great affinity for air, aluminum has a natural, although thin, oxide coating that protects the underlying metal from further oxidation. Anodizing makes the natural coating thicker, more protective and more attractive.

Some anodized films are very hard and, therefore, resist abrasion and chemical attack. Some are clear and transparent. Most anodized aluminum for architecture is of the latter type, which can be given practically any color.

The mechanics of anodizing are comparatively simple. The aluminum is made the anode instead of the cathode as in conventional electroplating. The electrolyte used must yield oxygen. The oxide film may be 0.0001 to 0.0004-in. thick compared with the natural oxide coating which is about 0.0000005-in. thick.

When an electric current is passed through the work, a porous oxide layer forms on the surface. Progressive oxidation then takes place underneath this film. Porosity of the outside layer permits building up films underneath.

PROTECTION—not color—is prime reason for anodizing manifold section of gas turbine engine.

If the oxidized work is immersed in an organic or inorganic dye, for example, the color is absorbed into the pores of the coating. Color and hardness of the film varies to some extent with the type of alloy.

The aluminum oxide coating can be converted into a monohydrate by a "sealing" treatment with boiling water. Other sealing methods, some of which are patented, use chemical solutions. These treatments close the pores and make the coating non-absorbent.

Anodized coatings may be produced in several ways, including the chromic acid process which meets government specifications and is generally used in special applications. It produces a gray or gray-greenish aluminum oxide film which is inert, corrosion resistant and somewhat absorptive to dyeing treatments. Film thickness depends on current density and time of treatment. The process is particularly adapted to anodizing of assembled parts.

The Alumilite process, patented by Aluminum Co. of America, uses varying concentrations of sulphuric acid as an electrolyte and yields oxide films from 0.0001 to 0.001 in. thick. These coatings resist corrosion, abrasion and heat; they also have good dye absorptive properties.

The sulphuric acid process is probably the most economical anodizing method. Appearance of the coating varies, depending on the alloy, time at temperature and solution concentrations.

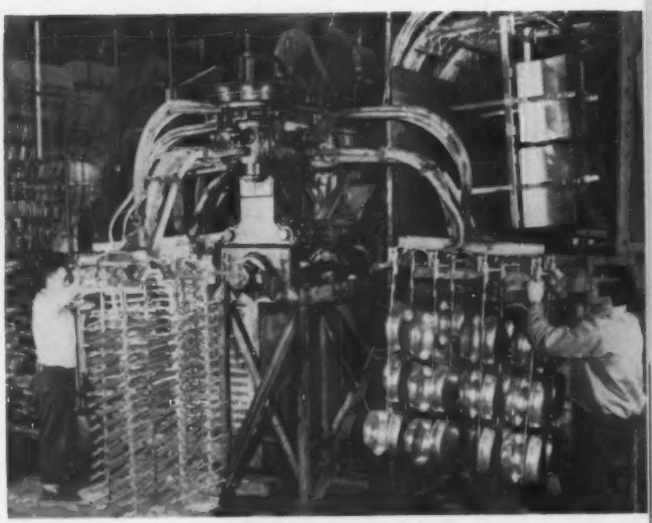
### Yields reflecting surface

Another treatment, known as the Alzak process, produces a highly reflecting surface by using a 2.5 pct solution of fluoboric acid as an electrolyte. It yields a thin oxide film which may be increased by subsequent anodizing in sulphuric or other acids to obtain a clear coating that is resistant to heat and corrosion.

The patented Brytal process also produces excellent reflecting surfaces by treating the work anodically in an alkaline solution having a pH of at least 10. After rinsing in water, the work may be anodized further in a solution of sodium bisulphate to give it a clear, transparent film.

In addition to a good reflecting surface, work coated by this technique has good corrosion and abrasion resistance. The film resists the tarnishing effect of many chemicals and can be used for outdoor exposure. Grime accumulation can be removed by cleaning with mild soap and water.

A number of additional anodizing processes are available in which oxalic acid, sulfamic acid, phosphoric acid, and boric acid may be used. Battelle Memorial Institute recently developed a method for producing high reflectivity on an aluminum sheet by using a bath of 40 pct sulphuric acid and 60 pct phosphoric acid.



**TUBULAR** shelf dividers (left) enter anodizing cycle in job shop as gold-colored frying pans (right) emerge. Meanwhile, tape recorder facings are drying and await their turn to be unloaded.

Several methods, some patented, are used to color the oxide films produced by anodizing treatments. They include the absorption of organic or inorganic dyes, as well as the production of a colored film directly from the electrolyte with acids and addition agents.

One new process, patented by Kaiser Aluminum & Chemical Corp., produces a gold anodic finish without dye. In this process the source of the color is built in by adding certain readily alloyed constituents to molten aluminum. Controlled anodizing brings out desired color.

The growing interest in anodized finishes for aluminum has brought a slow, steady growth in the number of production job shops equipped to handle such work.

Volume at a typical job shop, Light Metals Processors, Inc., Chicago, Illinois, has increased more than 300 pct in four years. Products treated include automotive trim, refrigerator parts, and multi-colored tumblers.

Equipment sales figures are additional gages indicating the rapid growth of anodized aluminum finishes. Frederic B. Stevens, Inc., Detroit, a leading equipment manufacturer, says that dollar volume of sales in 1955 was nearly double the combined total of 1953 and 1954.


ACKNOWLEDGMENT

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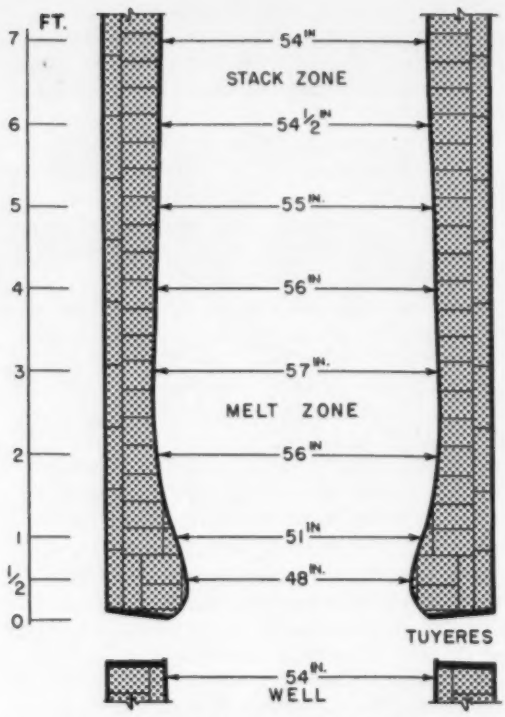
**Logs profits daily—**

# Small Shop Fights Back With Casting Quality

By A. W. SCHNEBLE,
Vice President,
Advance Foundry Co.,
Dayton, O.




**STANDARD CONTOURS of cupola help standardize melting, permit use of statistical quality control.**

**◆ Job shops have certain advantages over their bigger neighbors, including customer convenience and lower overhead . . . Despite this, a number have lost business in recent years.**

**◆ Statistical quality control, plus a tailored cost accounting system, is helping some to bounce back . . . They'll pinpoint areas of weakness, and keep closer tabs on the profit angle.**

◆ STATISTICS AND QUALITY might still sound unrelated to some, but together they spell life and profits to most large metalworkers. Now even small job shops can control product quality through improved techniques in sampling.

Extension of similar methods into cost accounting areas carries added benefits. Every week if necessary, a summary sheet informs job shop management of a profit or loss over the past seven days.

Equally important, departmental breakdowns pinpoint where the money went and why. Trends in product quality, raw material quotations, local labor losts and other pricing factors become obvious. Result is a coherent picture of job shop operations depicting what is happening now and what is likely to happen in the near future.

To some plants, competing in less stable areas of metalworking, these tools can make the difference between a comfortable profit and unhappy bankruptcy. It may tell you whether or not you will have a job next year.

Previously job shops generally have neglected statistical quality control and cost accounting. These tools for control of production costs can't apply, some argue, outside mass production setups. Short runs and statistics, they declare, contradict one another.

Many job shops no longer believe this. Some have disproved it already by actual application in such traditionally short run production setups as job shop foundries.

### Control job shop cost factors

At Advance Foundry Co., Dayton, all these tools for low cost production are used, and more. The job shop casts short runs both of gray and alloyed iron in solid and cored molds. It also turns out a considerable yearly tonnage of high strength metal forming dies for the automotive industry.

Iron production averages about 900 tons monthly. Four basic irons are produced regularly in cupolas, and twelve additional alloys intermittently. Alloy additions to standard compositions bring the total number to 22.

## STATISTICS CAN HELP

**Detail your profits**
**Pinpoint your losses**
**Spot wastefulness**
**Standardize processing**
**Upgrade product quality**
**Predict next year's business**

Product quality starts with sand control. The foundry constantly checks raw material, mix and return grades. The responsible foreman supervises daily testing of six different sands plus heap sand for: 1) uniformity, 2) percentage moisture, 3) green compressibility, 4) green permeability, 5) dry permeability, 6) deformation, 7) toughness, 8) hardness, and 9) dry tensile strength.

Fully automatic sand preparation, blending, and delivery assure even closer mix control.

In melting, three factors make possible statistical quality control. Precision instrumentation, rigidly controlled operating procedures and a comprehensive records system yield highly accurate data, suitable for sampling.

Cupola ID is measured daily at specified levels from the well to the stack. Volume of the melt zone and of the stack is then calculated, tabulated and recorded. Semi-fluid refractory material blown against the wall builds up the contour to the depth required.

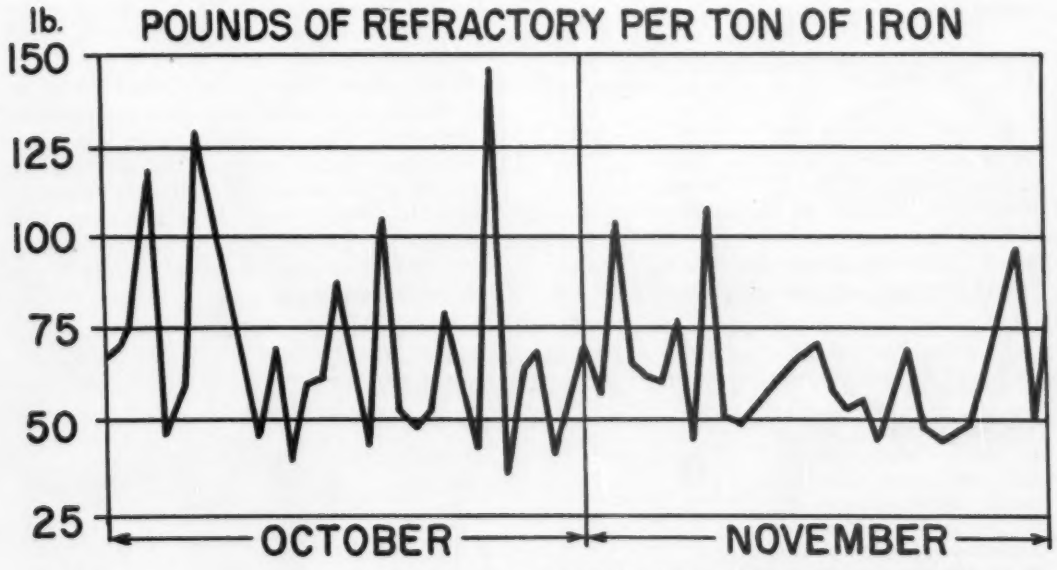
Instrumentation on the cupola provides close melt control for accuracy and uniform composition. Air metering through the tuyeres standardizes temperature conditions.

Dry and wet bulb temperature records enable calculation of carbon pickup due to moisture. A planned automatic humidity control system will monitor humidity and govern it by adding moisture to the blast air. This will eliminate costly drying operations to hold charge moisture content within desired limits.

The foreman keeps complete records of each day's production, and oversees preparation of sample bars from each ladle for metallurgical analysis. The cupola report logs materials charged and iron produced. A production record details type and amount of each alloy poured and where used. An alloy record shows distribution of alloy additions. The heat log follows condition of cupola and charges throughout each melt.

Data gathered daily from each shift are correlated in the control department and entered on annual graphs and tables. These collectively constitute a permanent record of foundry operations. They not only show the condition of production, but also indicate trends in pricing, estimating and over-all capacity.

Permanent records are easily figured and simply applied, even under a broad range of conditions, thanks to statistical control methods. For example, experience indicates that recording the ladle analysis only on every four charges provides a sufficiently accurate statistical sample. This cuts testwork to one-quarter of that previously.




DAILY LOG tells foundry where their refractory goes, whether it is wasted or not.

Some production tips—

# Are Poor Bends Draining Your Stamping Profits?

◆ Just simple bends in simple stampings, so where can you go wrong . . . But when one detail piles on another, get ready for a big headache and some out-of-pocket expense.

◆ Bend your blanks properly, then watch stamping costs drop and profits grow . . . You'll save time, reduce scrap and make a better product . . . Here are some of the hidden problems and the paths around them.

By FEDERICO STRASSER, Consultant, Santiago, Chile

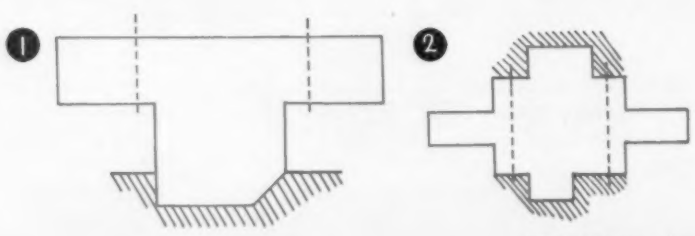
◆ MAKING SIMPLE BENDS in diecut blanks seems easy—that is, until you run into all the hidden problems. One variable piles on another, each getting more stubborn to overcome. But why this expense and waste of time and money? It's unnecessary and can be avoided.

Both stampers and designers can apply the basics of bending with success. Shop tested, they reflect advanced thinking on trouble-shooting approaches most likely to hold stamping costs down to a competitive level. Coordination between blank designer, toolmaker and the production floor will help even more.

Consider first the factors affecting bending and mild forming of blanks. Some and possibly all these influences also are important in designing and stamping the blank. How can these same factors be handled to answer bending troubles in a positive manner?

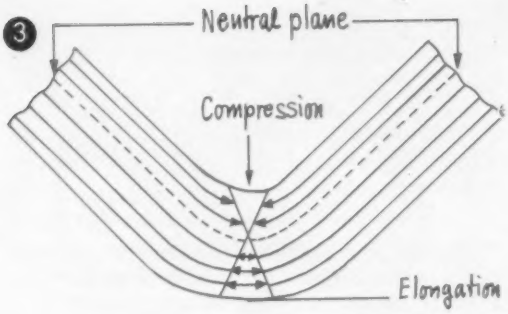
Grain orientation in sheet metal refers to the direction in which the material lengthens when rolled. Tensile strength along the grain is less than across the grain. To best use the strength of the metal, bend at right angles to the grain. Where multiple bends make this unfeasible, angle relation of bent edge to grain flow should be no less than 45°. Avoid bends parallelling the grain.

**TWO PREVIOUS ARTICLES by the author summarize for IRON AGE readers other advanced shop practices in design and production of stamped parts: 1) Blanking—March 15, 1956, p. 83; 2) Piercing — April 5, 1956, p. 108.**



## What Causes Bending Troubles?

**▪ Grain orientation of blank ▪ Location of burrs ▪ Bend radius ▪ Blank size and length ▪ Blank contours ▪ Springback ▪ Length of bent flanges ▪ Design of blank retainer ▪**




Along diecut edges, one surface of the metal is stronger than its opposite. Punch action in blanking somewhat disintegrates the contact surface, weakening it up to 30 pct in thick plate. Take advantage of this by facing the burr side of the blank into the bend. This improves part strength, and also avoids premature wear of the female die.

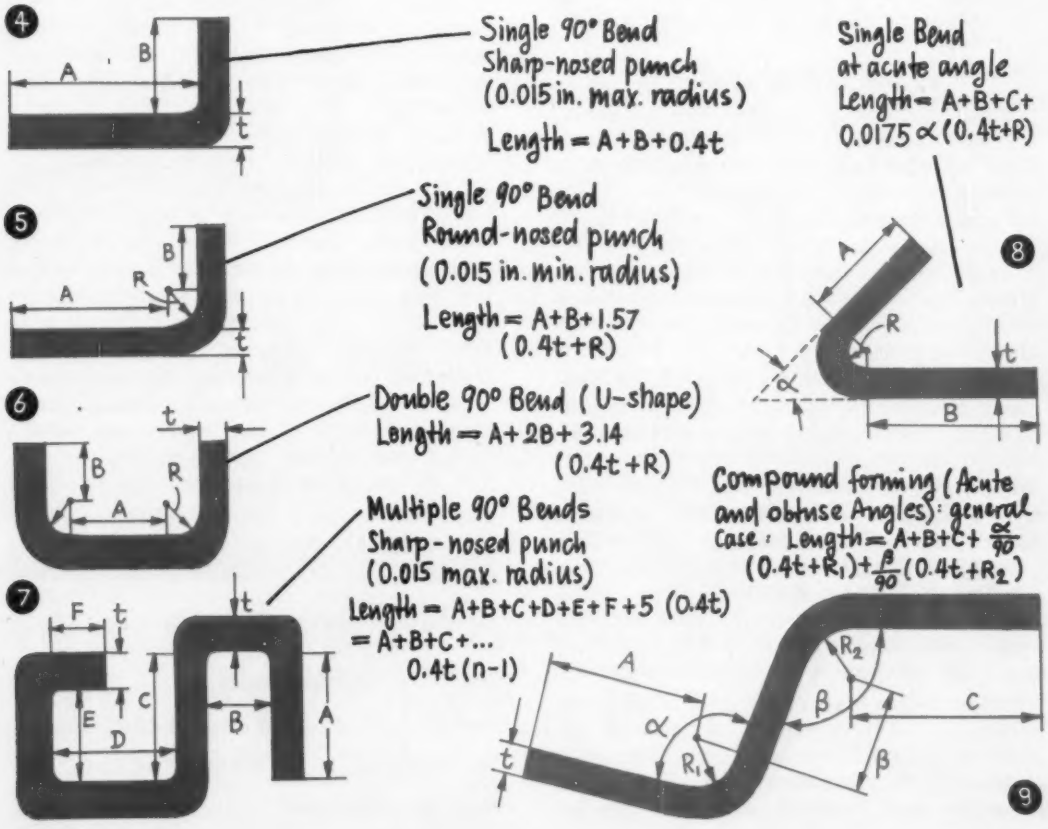
To assure that the burred surface always faces the punch, deliberately introduce irregularity into the blank design. Aim for a design that eliminates the possibility of positioning the blank face down in the female die.

Punch special holes to engage extra alignment pins. Trim an unimportant corner (Fig. 1). Modify a less essential section of the blank contour (Fig. 2).

Bend radius can prove troublesome. Poorly designed stampings incorporating inadequate bend radii cannot endure even the smallest mechanical loads without cracking, tearing or fracturing in the bent zone.

### Here's how to figure final length of bent parts

**TABLE I**



**"Consider the manufacturing economies . . . Remember each added step boosts costs."**

Undoubtedly, bend radius should not fall below certain limits. But how close can you come while retaining the necessary safety factor?

Lowest value can be determined only by practical trials under actual production conditions. Certain generalities can be made. Table II lists values for use in initial check testing. Note that smaller values apply to sheet less than 0.04 in. thick, while the higher refer to the thicker gages.

Should cracking or tearing show up in the bend, remedy with one or more of the following: 1) increase bend radius, 2) barrel finish by tumbling blanks prior to bending, 3) anneal blanks, 4) decrease press speed, or 5) select a more ductile blanking material.

Choose a punch for bending with the greatest possible face radius. This permits greater latitude in selection of forming material. Necessary ductility need not be as high with broad-faced punches as with those of smaller rounding radii. In addition, often the resulting bend not only is stronger, but also is better in appearance.

### Realize possible bending economies

Outer surfaces of bent workpieces always are well rounded, even if comparably small inner bending radii are necessary. If functional or aesthetic requirements absolutely impel square outer edges, two operations are recommended. In the first, the workpiece is bent to shape with rounded edges. The second employs a squaring die that sharpens edge angle to 90°. Only soft metals can be conveniently handled in this fashion.

Before agreeing on the need for squared edges, consider the manufacturing economies. Remember costs increase rapidly with each additional stamping operation.

Figuring correct length of flat blanks to be bent is not always easy. Virtually all blanks stretch somewhat in bending. But the narrower is the blank, the greater is the elongation. Thus something must be subtracted from blank length as a bend allowance. With multiple bends at right angles to one another, both blank length and width must be slightly undersize.

So how do you determine final length of bent workpieces? One approach suggests itself. Measure and add the lengths both of the bent flanges and the remainder of the blank. This procedure does apply to bends produced by punches of comparably large radii, 3 to 4 times the stock thickness. But what of the smaller bends: Which dimensions are to be added—the internal ones or the external?

Actually, neither is the correct answer. Practical experience shows that the true length to be measured generally lies between the two metal surfaces—and not halfway between as one might think. Rather it is found at some imaginary line (a so-called neutral plane) located between the geometric midline of the blank and the surface toward which the metal is bent.

### Determine bend allowance

Reason for this involves stress of the metal fibers in the folding zone of the bend. Fibers on the inner side are compressed. On the outer side, they stretch. Generally the compression is less pronounced than the tensile effect, hence the theoretically unstressed neutral plane moves toward the compressed surface (Fig. 3).

Such variables make accurate determination of bend allowance most difficult. So troublesome is the problem, that shops commonly measure either surface, ignoring the neutral plane idea completely. Once a particular surface length is measured, be it upper or lower, all allowances subsequently calculated apply only to that surface.

The formulas in Table I represent current practice in calculating bend allowance. They apply only to bends formed at right angles to grain orientation of the sheet with punches of rounding radii not exceeding four times stock thickness.

Values obtained through these formulas are only approximations. Final dimensions of bent workpieces always vary somewhat, even when sheet from the same batch is bent on the same setup under identical conditions. So where high precision is needed, ignore bend elongation and supply parts with a trim allowance. Such practice, however, should justify its additional manufacturing costs.

Another easily overlooked factor concerns that line where bend meets blank edge. In all cases, this angle of incidence should be 90°. Lower local stresses result and improved service life of the part can be anticipated. In

**TABLE II**

**To Find Smallest Permissible Bend Radius**

| | Multiply Stock Thickness (in.) by |
|---|---|
| Soft Metals | 0.3 to 0.7 (0.02 in. min) |
| Hard Metals | 0.6 to 1.2 (0.06 in. min) |
| Very Hard Metals | 2.0 to 3.0 |

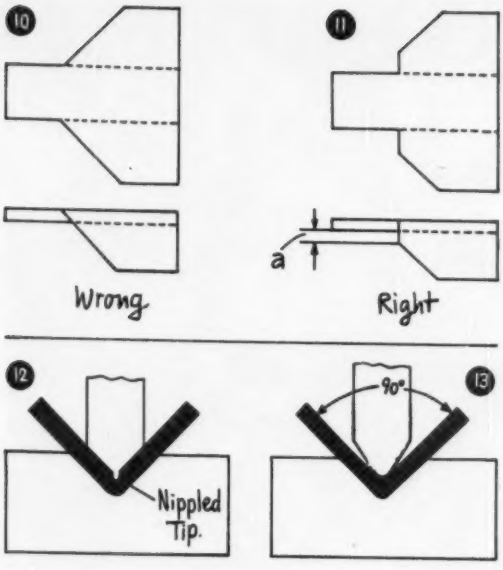



Fig. 10, altering design to that of Fig. 11 accomplishes this.

Springback is a topic many shop foremen would rather not be quoted on. It's a problem with many metals, particularly titanium. But springback must be controlled to maintain tolerances.

Essentially, springback is rebound of the bent metal due to its natural elasticity. Springback shows itself in workpieces that present a somewhat greater bending angle than the mating angle of the tool that produced it. Accurate control is a matter of practical experience, although some estimates can be made. In this case, understanding of the factors involved will help cut shop test time.

### Control springback

Each material to be bent has its own springback character. In addition, differing mechanical properties of the same metal result in varying springback.

Tensile strength, yield strength, rate of workhardening and temper are important. More fully tempered materials display more springback. Higher yield strength metals show a greater springback index. Thus in sheet steel, carbon content largely governs springback angle.

Sheet thickness affects springback: The greater the thickness, the less the springback. Bend radius too influences springback: The sharper the bend in relation to metal thickness, the less the springback.

Other less vital points also enter:

1) Springback varies according to the angular relation between the bend line and the grain orientation of the metal blank.

2) Die setup clearances and alignment must remain unchanged throughout the entire production run to hold constant springback values.

3) Length or area of workpiece contact with die affects springback in that stresses are spread more evenly along greater lengths. Hence the metal assumes a permanent set more easily, reducing springback.

4) Press ram speed mildly influences springback. Slower speeds with longer intervals of full compression encourage permanent setting and reduce springback.

5) When employing bottoming dies, correct regulation of the press stroke decidedly influences the springback index. The more energetic is the bottoming action, the less is the springback, since permanent set of the workpiece is improved.

Although each of the preceding factors can be tinkered with to solve springback riddles, most shops combat the problem with one or more of the following weapons: 1) overbending, 2) restriking, 3) special dies, or 4) heating the stock immediately prior to bending.

Overbending is the simplest and most frequently practiced. It assumes a series of trial and error experiences to determine just how much the metal is to be overbent.

When overbending in channel forming, the punch can be undercut on both sides. The undercut angle should exceed springback angle by 20 pct. Cushioned dies also can be employed.

### Restrike for precision bending

Restrike your workpieces where bending angle values must be held to quite close tolerances, and the springback angle is rather difficult to control. Employ sizing dies in a second operation. Again, first consider the cost factor before proceeding.

Several methods for governing springback call for special dies that bottom the workpiece in the bending zone. Properly employed, they permanently set the metal, and counterstress residual elasticity. Avoid their use normally, since metal structure is affected unfavorably.

One special method requires a punch nippled at its centerpoint (Fig. 12). Another employs a punch angle slightly less than that of the female die, plus a radius at the root of the die opening (Fig. 13). Metal in the folding zone is thus slightly coined.

Heating the blanks will assist springback control, but it is costly, generally slow and difficult to control. Resort to its use only when other methods are more costly or less adequate.

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*Reprints: From one to three reprints of this article are available as long as the supply lasts. Write Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.*

Fig. 1—Operator keeps watchful eye on automatic welding head as it moves along at 64 ipm. Protection is afforded by a shield of argon.

**Argon, $CO_2$ do shielding—**

# Welding Job Made Easier With Dual-Gas Setup

By F. K. MACK,
Technical Sales Representative,
Air Reduction Sales Co.,
New York

◆ Most often it pays to ride along with the same welding setup in making welds on the same assembly . . . That goes for the shielding gas as well as the equipment . . . Parish Pressed Steel Div. justifiably takes the exceptional approach.

◆ It finds a dual shielding gas setup for the same assembly an asset . . . On welding practice bombs, it uses argon for one weld, $CO_2$ for another . . . Outcome is faster welding, better quality and economy.

◆ AMONG the half dozen or so gases and mixtures used for the shielded-arc processes, there's no "one best" for every job. In fact, use of more than one shielding gas on the same job can be, and often is, both profitable and advantageous quality-wise.

Consider, for example, what they're doing at Parish Pressed Steel Div. of the Dana Corp.

At its Reading, Pa., plant both $CO_2$ and argon shield different seams of the same assembly in a high-production setup. Result is faster welding and better quality work, with maximum production economy.

Parish — one of the large heavy stamping plants in the country — makes automobile frames, long heat-treated alloy steel truck rails and a wide assortment of stamping and defense items. Among these are mild steel practice bombs for the U. S. Army.

### Two gases more efficient than one

Fabrication of these bombs calls for the welding of two seams, a circumferential and a longitudinal. The gas-shielded metal arc process (Aircomatic) is used, and high production is obtained through the efficient use of the two different welding gases. $CO_2$ finds application as the shielding medium for the circumferential seams; argon, for the longitudinal seams on the bombs.

Logic behind the use of two gases is simple. The circumferential or girth seams are ideally suited for the greater penetrating characteristics of $CO_2$ shielding. Because of the rougher nature of the arc in carbon dioxide, it is usually used where short arc lengths and deep penetration are satisfactory. The inherent stability of argon, on the other hand, permits wide variation in arc length and penetration. For this reason it is preferred on the longitudinal seam, where deep penetration is not desired. Splitting the job between the two shielding gases seemed the best answer.

### Argon used on longitudinal seam

Parish starts its welding production cycle with the longitudinal seam of the body shell. This is 12-in. in diam and 14½-in. long. Material is 1010 steel, 0.075-in. thick. An A-675 Aircomatic mild steel wire within a gas shield of 70 cfh of argon and 2 cfh of oxygen is used. Welding speed on this longitudinal seam is 64 ipm. The automatic Aircomatic head (see Fig. 1) moves along the seam of the shell, which is held tightly in a fixture with a water-cooled backing bar (0.020-in. deep slot) fixed directly beneath the seam of the shell.

Bulkhead, body and nose of the bomb are assembled at one workpoint, before welding of the two circumferential seams using $CO_2$.

Ready for welding, the completed assembly is placed in a rotating fixture at the welding site, beneath two automatic Aircomatic heads (see Fig. 3). Welding speed, with the seams rotating under the fixed nozzles of the two Aircomatic heads, is 112 ipm. The required weld is 1/32-in. reinforcement. A-675 Aircomatic mild steel wire used has sufficient quantities of manganese for strength and silicon for weld soundness to overcome the oxidizing effects of a $CO_2$ arc.

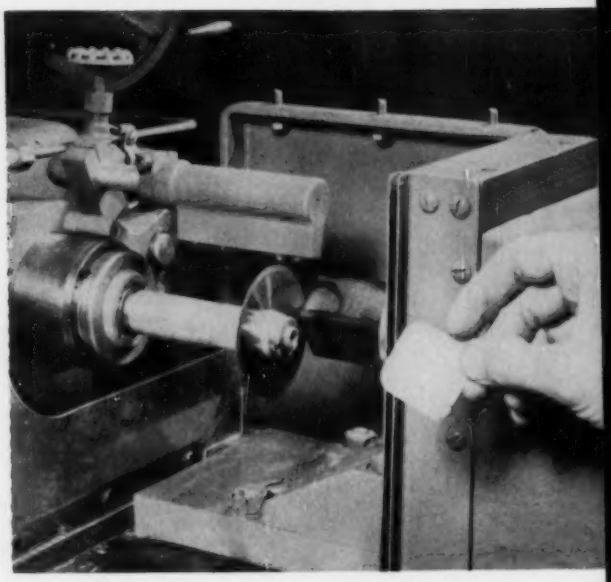
On completion of this circumferential welding operation the bomb is automatically ejected to a conveyor for removal. $CO_2$ is supplied by liquidors, each holding 600 lb of dry ice.

Fig. 2—With longitudinal seam welded and components assembled, it's now "bombs away" to $CO_2$ welding setup to finish circumferential seams.

Fig. 3—Here's setup that welds the circumferential seams at a speedy 112 ipm. Two automatic heads do the job as assembly rotates under them.

*For critical materials—*

# Precision Slicer Shaves Metal Waste



Waste of valuable germanium is minimized by rotating the work piece, slicing with circular saw.

◆ QUESTION: How do you go about cutting brittle, crystalline semi-conductors like germanium and silicon into tiny pieces? Moreover, the pieces must be dimensionally accurate since they form the working parts of transistors.

At the same time, how do you reduce waste in cutting these extremely expensive materials, with germanium, for instance, at $400 per pound?

One answer is with the machine above.

Called the "Microtomatic" precision slicing machine, the unit is an automatic, hydraulically-actuated, circular sawing device employing a thin, circular diamond saw blade. Developed by the DoAll Co., Des Plaines, Ill., the unit mounts a 6 x 18 in. work table providing ample room for work holding fixtures. This moves on hand-scraped ways feeding germanium or silicon crystals, generally in the form of an ingot 4 to 5 in. long and up to 1½ in. in diam, into the cutting wheel. Rates as low as 1/16 ipm are possible.

### Hydraulic control highly accurate

The operator maintains supervision, easily adjusted trip dogs controlling the length of cutting stroke and providing automatic quick return at speeds up to 50 fpm. When slicing, automatic cross-indexing takes place on the return stroke. The operator sets this at the hydraulic control panel to produce slices of any desired thickness accurate to ± 0.0005 in.

The cutting operation first involves slicing germanium into thin wafers 0.010 to 0.15 in. thick. Where power transistors are the end product, the entire wafer may be used but more often it is cut or "diced" into squares as small as 0.050 in. on a side, before being lapped and etched to final thickness.

Achieving the desired electrical characteristics in the finished transistor requires that the crystal be sliced relative to its crystallographic planes. These are determined by X-ray examination. Accordingly, slicing is not always done at exact right angles to the longitudinal basis of the crystal bar. As most commonly done up to now, the crystal—cemented to a work-holding plate—is set up on a work table in proper relation to the cutting plane of the circular diamond saw blade. This blade is large enough in diameter to cut through the entire cross section of the crystal. For a 1½ in. diam crystal bar, the thinnest practical circular diamond saw for this method cut a slot 0.030 in. wide.

This obviously meant, in producing 0.015 in. va or 0.020 in. thick wafers, that more of the expensive material was reduced to dust than converted to usable wafers.

The slicing fixture used with the new machine gets around this by rotating the crystal at an appropriate speed during cutting, making possible the use of a diamond saw only large enough to cut to the center of the workpiece.

Thus for crystals under 1½ in. diam, for example, a 3-in. saw may be satisfactory—and reduces only 0.015 in. of material to dust.

# here's proof

This ogive was deep drawn from a sheet of Weirzin.
Photomicrographed cross sections from ogive are magnified 1500 times.

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# New Technical Literature:

## Catalogs and Bulletins

### Belt conveyor

A 4-page bulletin on a new lightweight, aluminum power belt conveyor is now available. The fully illustrated bulletin gives detailed information on the construction advantages incorporated in this new power belt conveyor for general uses. It explains why it is impossible for the carrying belt of this Ve-Be-Veyor unit to run off center and how easy it is to "take-up" the belt. Complete specifications, including such important information as frame construction, dimensions, weights of the three sizes available and motor power, are fully explained. *A. B. Farquhar Div., The Oliver Corp.*

**For free copy circle No. 1 on postcard, p. 113**

**FOR YOUR COPY**

***Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 113.***

### Company profile

Thirty-four page booklet, "Metal Fabrication" has been issued by The Risdon Mfg. Co., Naugatuck, Conn. The booklet shows the location of the three Risdon plants in Waterbury, Naugatuck, and Danbury. Featured are Risdon's main products, small metal components and assemblies of parts. Shown in pictures are many typical items as well as the machines that make them. *Risdon Mfg. Co.*

**For free copy circle No. 2 on postcard, p. 113**

### Casting compound

Illustrated 20-page booklet describing a precision casting process explains in simplified form how this Glascast powder is made into a shock-resistant, precision casting mold for high melting point alloys. Production schedules for pilot run quantities of fine surface finish and close tolerance castings are given in the booklet. Also included are detailed explanations on mixing the plasters for the basic molds and mixing the powder to form a suitable slip. *Corning Glass Works.*

**For free copy circle No. 3 on postcard, p. 113**

### Threaded parts

The art of doing two things at once —making a metal blank larger and smaller at the same time—by a cold-forming double-extrusion process is described in a 4-page folder. The process is mentioned as permitting the upsetting of metal for the head of a cap screw at the same time as the shank diameter is extruded down to an accurate pitch diameter for the rolling of threads. *The Cleveland Cap Screw Co.*

**For free copy circle No. 4 on postcard, p. 113**

### Metalworking aids

A new 16-page illustrated catalog covers a line of water based metalworking products for machining, grinding, rolling, drawing, forming and stamping. This catalog describes the properties and uses of the firms Improved Lusol, K-7, Shamrock, Unikool, Machine Cleaner, G-3 Germicide, Rust Preventive and Water Conditioners. *F. E. Anderson Oil Co.*

**For free copy circle No. 5 on postcard, p. 113**

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### Spring mountings

A line of heavy-duty general-purpose steel spring vibration mountings is described in a catalog just released. The vibration mounting combines the characteristics of steel springs with damping, sway and thrust control elements to achieve isolation in a single mounting. *T. R. Finn & Company, Inc.*

**For free copy circle No. 6 on postcard, p. 113**

### Gas mixing, measuring

A manufacturer of widely used gas measuring and mixing apparatus announces a 24-page booklet covering Btu. control information for public utility and industrial gas plants. Entitled "Where Experience Counts," the publication contains information on gas dilution and enrichment, gas stabilizing and mixing operations; plus additional data, installation photos, special features and schematic diagrams involving various gas mixing and measuring. *Cutler-Hammer, Inc.*

**For free copy circle No. 7 on postcard, p. 113**

### Rebuilding machine tools

In pictures and captions, an 8-page folder describes a series of special-application machine tools, and rebuilt and modernized equipment.

Illustrated case histories tell how this firm rebuilt and modernized two obsolete vertical boring mills, readying them for 1956 production at large savings to the owners. How a worn, rusty 30-in. grinder was brought up to the minute is the subject of another section. The machine, with an entirely new grinding head and push button controls, is used today to grind large crankshaft journals. *Simmons Machine Tool Corp.*

**For free copy circle No. 8 on postcard, p. 113**

### Parts feeders

Brochure covers a company's line of vibratory equipment for parts feeding. Described and illustrated are bowl feeders, a vibratory power unit, drive units with remote control panels, overhead hoppers, track units and orientation tracks. *Perry Equipment and Eng. Co.*

**For free copy circle No. 9 on postcard, p. 113**


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American METAL TURNINGS Crusher

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Gnarled up with thousands of others like itself, it becomes a problem in space . . . gallons of re-usable cutting oil are trapped in the folds . . . and the scrap value is greatly minimized.

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The large powerplant access door utilizes ten "B" Series PIP drive-in, drive-out pins in the hinge-type attachments as shown in photo. Locking is positive and automatic!
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FREE TECHNICAL LITERATURE

## Die filers

A line of die filing machines are detailed in a new 4-page brochure. The units, available in three models, are described as having a table of heavy ribbed construction, rigidly supported on two brackets and capable of being tilted 12° in four directions for filing compound angles. *Sales Service Machine Tool Co.*

**For free copy circle No. 10 on postcard, p. 113**

## Railroad switches

Entitled "SwitchMobile—diesel railroad switcher on rubber tires," a new bulletin gives information on two of this firm's newest products. Described are the SwitchMobile and SwitchTractor, a pair of extremely maneuverable rail car switchers which run on rubber and speed from job to job over any terrain without having to follow rails or roads. *LeTourneau-Westinghouse Co.*

**For free copy circle No. 11 on postcard, p. 113**

## Roller bearings

A new 72-page catalog on a series of self-aligning roller bearings has just been published. The new catalog contains specification and data pages on all models of the firm's units, which have shaft sizes which range from ¾ in. to 7 in. *Chain Belt Co.*

**For free copy circle No. 12 on postcard, p. 113**

## 'Dag' dispersions

A fifth revision of a 4-page booklet, "A List of 'dag' Dispersions for Industry," lists 41 colloidal and semi-colloidal dispersions for metalworking, foundry, and related fields. *Acheson Colloids Co.*

**For free copy circle No. 13 on postcard, p. 113**

## Molybdenum carbides

Six-page bulletin summarizing applications; physical, chemical and mechanical properties; and preparation of molybdenum carbides and nitrides has just been published. Designated Bulletin Cdb-7, it covers two molybdenum carbides, $Mo_2C$ and MoC, and the two molybdenum nitrides, $Mo_2N$ and MoN. *Climax Molybdenum Co.*

**For free copy circle No. 14 on postcard, p. 113**

**TO THE FASTENER BUYER:**

Lamson & Sessions has manufactured Aluminum fasteners for the aircraft industry for many years. Therefore their experience with aluminum goes back a long ways. Now, however, Lamson has added to its aluminum line standard fasteners from stock.

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Lamson & Sessions has now added "standard" bolts, nuts, screws and cotters of aluminum alloy to its famous full line of fasteners.

Henceforth the products illustrated above will be readily available. They come in a wide range of standard sizes, including machine screws down to No. 6 diameter by ¼" in length.

This means that users of aluminum bolts and nuts can now buy at competitive prices with the added advantages of fast delivery and service.

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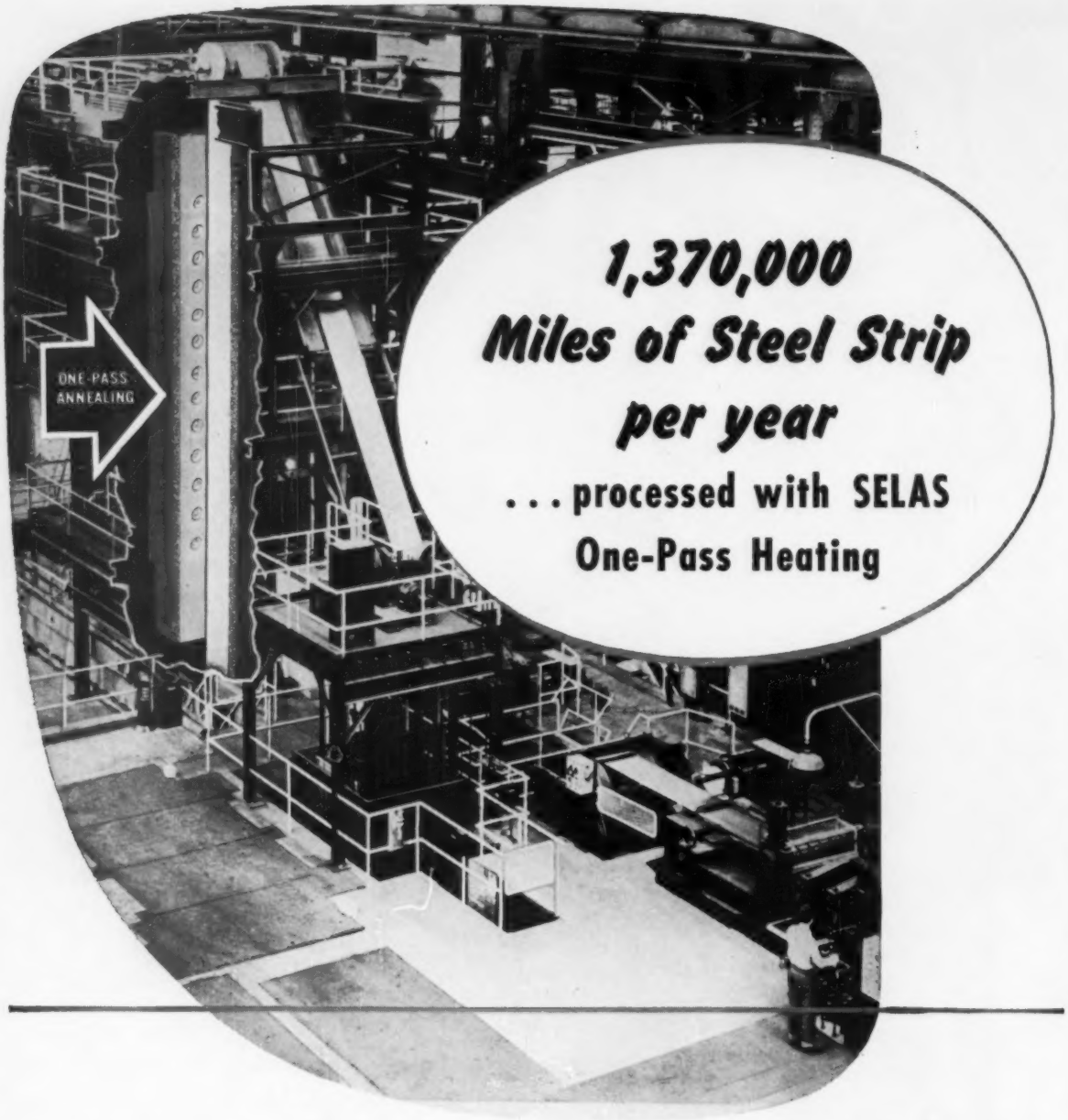
**LAMSON'S FASTENER EXPERIENCE IS NOW *YOURS* IN ALUMINUM**




# 1,370,000 Miles of Steel Strip per year

## . . . processed with SELAS One-Pass Heating

*Enough steel strip* to go around the world 55 times, is processed per year in Selas one-pass Gradiation furnace installations throughout the steel industry.

The Selas direct-fired heating principle is used in a number of continuous strip applications, including:

*Bright annealing of steel . . . stainless steel annealing . . . tin reflow . . . galvanizing-annealing . . . preheat for galvanizing . . . preheat for annealing . . . bluing . . . special coatings . . . brass annealing.*

In all these operations, radiant gas heat, precisely applied across the strip width, increases heating speed and produces unsurpassed uniformity in product quality.

- Compact single-vertical-pass design saves valuable floor space . . . avoids rolls in heated section and accompanying maintenance and product quality difficulties.
- Elimination of externally-prepared atmosphere in heating section reduces operating costs.
- Precise thermal control assures reproducible uniformity, regardless of gauge variations.

The same benefits are also being achieved in continuous annealing of nonferrous metals.

Our engineers will be glad to discuss how Selas Gradiation methods can be tailored to your strip-heating needs. Address Dept. 15.

**SELAS**
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**DRESHER, PENNSYLVANIA**

*Heat and Fluid Processing Engineers*
**DEVELOPMENT • DESIGN • CONSTRUCTION**

# FREE TECHNICAL LITERATURE

**These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.**

This section starts on p. 108

## Valves and indicators

A 44-page booklet describes and gives specifications on a line of British-made piston valves, level indicators and sleeve-packed cocks. Cross-sectional views are included of many of these units. Installation information is given on the products described. Back-of-the-book tables include those on British standard threads, conversion of milimeters to inches and decimal equivalents of fractions. *Richard Klinger, Ltd.*

**For free copy circle No. 15 on postcard**

## Hardness tester

A new product sheet describes a portable Brinell hardness tester with test head for deep and offset testing. The unit, mentioned as getting into narrow, cramped spaces and reaching around corners and flanges and into holes, is designed to get hardness readings in places other testers cannot reach. Another product sheet details the firm's Brinell microscope — developed for reading impressions where other microscopes will not fit. *King Tester Corp.*

**For free copy circle No. 16 on postcard**

## Gaging systems

Gaging systems and standardized control units are described, illustrated and diagrammed in a 26-page catalog. The applications, characteristics and elements of electric control, air-electric control and electronic control are covered in the first three sections of the book. A fourth section details types of control gaging on and off the machines as well as continuous process and differential gaging. *Federal Products Corp.*

**For free copy circle No. 17 on postcard**

## Excitation unit

New catalog describes the Varisource, an all-in-one excitation unit for spectrochemical analysis. A completely redesigned model of an earlier instrument, the Varisource, as described in the catalog, is made in three standard models, deluxe, custom and standard. Each model is available with up to five different excitation circuits including high voltage ac spark, low voltage ac arc, ignited uni-arc, dc arc and high voltage ac arc. The catalog gives a complete description of the instruments. *Jarrell-Ash Co.*

**For free copy circle No. 18 on postcard**

## Variable speed drives

The eight points to consider in selection of variable speed drives are among the features contained in a new folder. The publication also gives the operating features, engineered advantages and applications for this firm's variable drives. Cited benefits of their units are infinitely variable speed, accurate maintenance of speed, transmission of full rated horsepower, long belt life and compact design. *Sterling Electric Motors.*

**For free copy circle No. 19 on postcard**

## Plate lifting clamps

Line of plate clamps are detailed and illustrated in a 4-page folder. Detailed discussion and specifications are contained on a vertical plate grip with shackle, a set-screw plate grip, a double cam plate grip, standard horizontal plate clamps, a bulldog horizontal plate clamp, roller chain tong grip, V plate hooks, spreader hooks, sheet bundle hooks and cradle hooks. *Lucker Mfg. Co.*

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## Demineralizer

Descriptive bulletin is available on a mono-column demineralizer. This model MA-500 unit, which operates on the mixed bed principle, produces up to 500 gph of super high purity water (effluent readings as high as 15 and 20 million ohms). All operating functions, including the regeneration cycle, are fully automatic, the literature states. *Penfield Mfg. Co.*

**For free copy circle No. 21 on postcard**

## Bar stock

Bulletin No. 152 offers complete information on both tubular and solid types of Meehanite metal bar stock. These high strength bars are described as well suited for the production of valves and pump parts, small gears and pinions, sleeves, liners, bearings, bushings and countless other common and special items. *Shenango-Penn Mold Co.*

**For free copy circle No. 22 on postcard**

## Compressor

Engineering catalog details a new compressor. This Type FMP reciprocating compressor is built for field pick-up service, gas boosting, air drilling and general industrial use. It is available, states catalog, with either single or twin frames, with single or multi-stage compressor cylinders. Ratings are up to 600 hp as belt-driven or completely packaged unit. *The Cooper-Bessemer Corp.*

**For free copy circle No. 23 on postcard**

## Testing instruments

Eighty different devices are covered in a 40-page "testing-instruments reference book" just published. Titled the "Measurement Equipment Catalog," GEC-1016, the publication contains complete product information including applications, sources of additional information and pictures. Ranging from simple thickness gages to the mass spectrometer leak detector, there are instruments for research, production, laboratories and educational use. Measurement categories include color, leak detection, insulation, and radiation monitoring. *General Electric Co.*

**For free copy circle No. 24 on postcard**

## Expanded metal

"Minimesh," a small-mesh expanded metal, is illustrated and described in a new 4-page folder. Included are weights and dimensions for the various gages and strands available, both standard and flattened. Minimesh is mentioned as used for decorative purposes and for guards or grilles on stoves, heaters, radios, and coin-operated phonographs, etc. Illustrations of four typical applications are included in the folder. Ten mesh sizes are shown life size. *Penn Metal Co., Inc.*

**For free copy circle No. 25 on postcard**

## Folder and brake line

New, illustrated, 2-color Bulletin 74 presents modernized lines of folders and brakes, both air actuated and hand operated models. Described and illustrated are the firm's adjustable bar folders, foot brakes and universal folders and brakes. Complete details and specifications are given for each of the models. *Niagara Machine & Tool Works.*

**For free copy circle No. 26 on postcard**

## Capsular elements

Recently released bulletin announces availability from stock of a large selection of capsular elements for the aircraft and instrument industries. Full engineering specifications and dimensions are tabulated in the 8-page, 2-color bulletin. Also shown are diagrams and dimensions of spacers and typical end fittings for bellows assemblies. Data given is described as of service in enabling a design engineer to select and assemble the proper capsular component for his specific application. *The Bristol Company.*

**For free copy circle No. 27 on postcard**

## Brazed parts

The advantages of taking components such as stampings, tubing and screw machine pieces and joining them with a low-temperature silver brazing alloy are described in a new company publication. Photographs and descriptions of some of the parts thus assembled are given on a 2-page spread. *Handy & Harman.*

**For free copy circle No. 28 on postcard**



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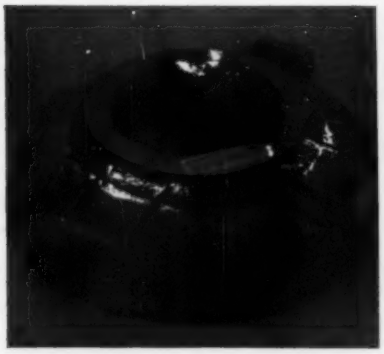
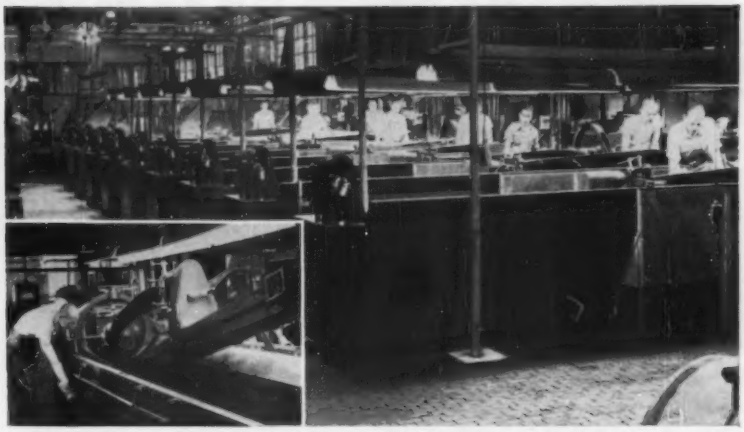
# Case Studies:
## NONDESTRUCTIVE TESTING SYSTEMS

**AUTOMATIC AND HIGH SPEED MAGNAGLO UNIT** inspects and processes steam turbine blades. By providing two-directional magnetization at the same time, it reveals cracks in any direction in a single "pass". An ideal method for lower cost, higher speed inspection needs.



**INSPECTING MAGNESIUM CASTINGS** — Inspection, as such, cannot produce a better product. However, by translating Zyglo indications into corrective measures the foundry can produce castings which meet the needs of their customers. Zyglo fluorescent penetrant inspection detects such flaws as cold shuts, cracks, blows, shrinkage and dross in non-ferrous magnesium or aluminum castings.



Specially designed Magnaflux units tilt for inside-outside inspection of hollow steel propeller blades.

## How Lower Production Costs Can Result From "Customized" Testing

Nobody expects to find defective propeller blades at 20,000 feet. Propeller manufacturers must, and do, discover even the tiniest flaws during manufacture and before their products ever leave the ground. A battery of specially designed Magnaflux units insures defect-free production at the Wright Aero Corp. New Jersey propeller plant.

Of course, you don't make propeller blades. Whatever your product, you can use low cost standard test equipment—or tailor-made production test equipment TO MEET YOUR OWN NEED!

Magnaflux methods detect cracks, seams, porosity and other minute defects during the production process. By evaluating M findings, the proper corrective steps are taken to eliminate early defects. Substantial savings result from increased production, doing away with further processing effort on faulty parts, and from reduced scrap losses.

If you're "up in the air" regarding defects in critical components, Magnaflux builds and sells nondestructive test equipment to meet your exact production-line or sample test needs. Or, if your operation requires only occasional reliable testing, why not investigate our Commercial Inspection Service, available on a low-cost basis in most major industrial communities?

For detailed information regarding either service, write today, or contact one of our nearby offices for a personal get-together with an experienced Magnaflux field engineer.

**HOW INVISIBLE FORCE DETECTS MECHANICAL DEFECTS**

M nondestructive testing is based upon simple magnetic principles. A part to be tested is first magnetized—then magnetic powders or fluorescent particles in oil are applied. Surface defects cause a break in the magnetic field—local magnetic poles cause particles to be held on part to mark extent of defect. Above—a Magnaflux indication on grey iron casting.

HALLMARK OF QUALITY IN NONDESTRUCTIVE TEST SYSTEMS

Write for complete details concerning any of the above case studies, (excerpts from MAGNAFACTS), or ask for our new booklet on Lower Manufacturing Costs.

*Take Your Inspection Problems to the House of Answers . . .*

**MAGNAFLUX CORPORATION**

7302 W. Lawrence Avenue • Chicago 31, Illinois

New York 36 • Pittsburgh 36 • Cleveland 15 • Detroit 11 • Dallas 19 • Los Angeles 58

SIMONDS
INDUSTRIAL
CUT GEARS
LARGE OR SMALL
HEAT TREATED OR
PLAIN

SIMONDS has over 60 years' experience in cutting quality industrial gears. We can supply any type of gear in cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite in a full range of sizes adaptable to the material. Also heat-treated, case or flame hardened gears of carbon or alloy steel. Send us your requirements for quotation.

Custom
GEAR CUTTING

SIMONDS' facilities can produce any type of custom gear from your blanks if you prefer. Same quality . . . same prompt service.

QUALITY GEARS FOR OVER 60 YEARS

SPUR GEARS
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Also stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

SIMONDS GEARS

THE
SIMONDS
GEAR & MFG. CO.
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# INSTRUMENTS: Springs Tested

**Springs, so small over ninety can fit on a dime, are scanned by an electronic device checking dimensions as they emerge from coiler . . . Only split-second is required for the inspection.**

Electronic devices are being used to control quality of springs so small they can't be measured manually.

The units are being used at the Connecticut Spring Corp.'s Hartford, Conn., plant.

Half of this firm's business is made up of jobs requiring 100 pct inspection. Springs start in the 0.003 in. music wire range and in increments of 0.001 in., extend up to 0.300 in. As one of the major consumers of specialty wire in the East, Connecticut Spring gets much of its music wire requirements from a Pittsburgh Steel Co. subsidiary—Johnson Steel & Wire Co.

### 'Building' Springs The Aim

To illustrate its attitude towards springmaking, Connecticut Spring uses the word "build" to describe manufacture of a spring.

From an overall standpoint, the toughest job in the shop is a precision compression spring from Hamilton - Standard Division of United Aircraft Co. Part of a reciprocal engine's carburization system, the spring controls the supply of gasoline reaching the engine.

The Hamilton-Standard spring is large enough not to require use of electronics in its production. One job that does, however, is a computer spring with reduced ends and an OD of 0.032 in. Free length is ± 0.002 in. Ninety-seven of them can be placed on a dime with plenty of room to spare.

### Split-second Scanning

An electronic device scans each spring as it emerges from a coiler. In a split-second the scanner checks to determine if the spring's dimensions are correct. If they aren't the device causes the spring to be ejected into the scrap pile and then brings the coiler back into adjustment.

**WANT MORE DATA?**

***You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.***

The Hamilton standard spring is tapered from a top OD of 1 in. to a bottom ⅝-in. OD. Free length is 1½ in. with 8½ coils in that distance. Distance between coils varies from 3/16 to ⅛ in. Made to AMS Specification 5112, the spring uses Johnson's 0.090 music wire. It weighs only half an ounce.

Before Johnson wire ever starts through the production process, it is subjected to a rigid inspection.

### Properties Verified

Johnson is required to certify the AMS 5112 qualities when it ships the wire. But upon arrival at the Hartford plant, a complete test of physical properties is undertaken to verify the specification. This

**Wire for precision springs must be flawless to avoid rejects.**

isn't all, because Hamilton-Standard insists upon a wire sample with every lot of finished springs.

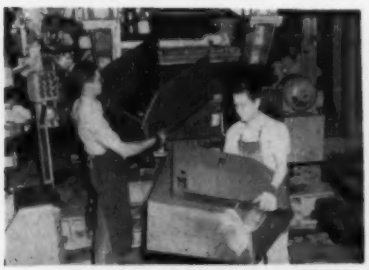
Wire, shipped in 50- to 60-lb coils, is run on a coiler which can handle ranges up to 0.149 wire. After the spring is coiled, it is subjected to stress relieving done in 30-minute to 2-hour cycles at temperatures from 450 to 600°F. Exact heat-treating time is determined by a trial run made on each Johnson shipment.

## Joining:

### Resistance welder aids liner production

Major cost savings have been achieved in production of refrigerator inner liners whose design enables use of a special resistance welder. The welder produces a completely welded liner in one operation. Previously liners required six seam welds, now three mash-seam welds are sufficient, reports Taylor-Winfield Corp., maker of the welder.

Ample flange widths enable elimination of later manual "corner" welding. One welding operation replaces the four operations previously required.



**Completely welded liner obtained in one operation.**

A total of eight operators are required on this liner line, in contrast to the 20 operators previously necessary. Two-thirds of welder output is sufficient to maintain line production rate of 90 assemblies per hour.

The welder features dual welding heads making series and indirect welds. Back and bottom welds are simultaneously welded with overlap to produce gas-tight corner welds.

When you buy *Acme-Gridley* you get **SERVICE** *ANYTIME, ANYWHERE*

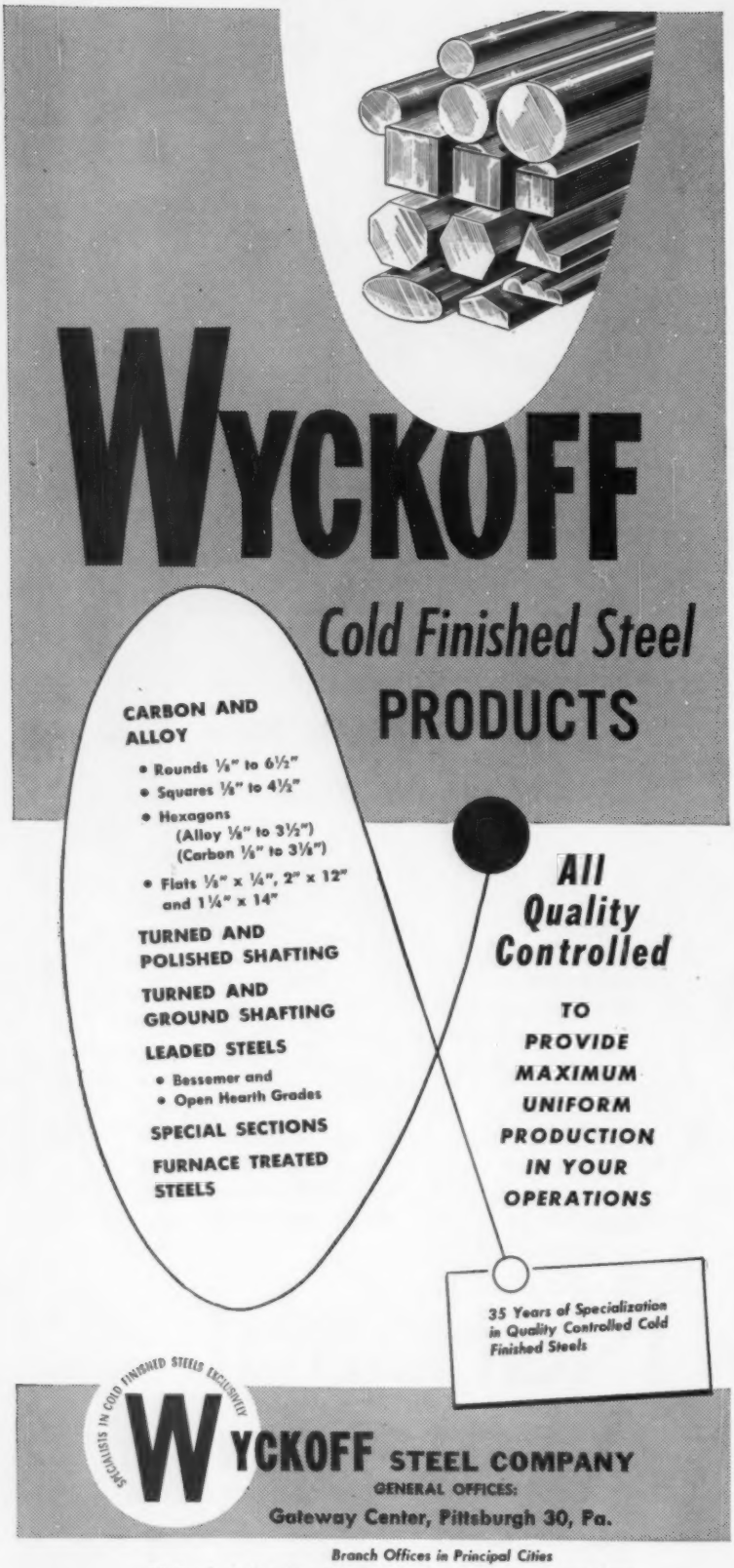
While your Acme-Gridley is being assembled, you may send your men to our plant to learn about tooling, camming and maintenance of your machine to insure *continued* top performance. Or, a competent demonstrator will perform the same function at your plant, upon delivery of your machine.

Either way, this service is supplemented by numerous service books, instruction manuals and parts catalogs. And, if you start a *training program*, this supplemental material will implement it.

National Acme

The NAMCO nameplate on your machine assures service — in emergency or normal situations — when and where you need it.

THE NATIONAL ACME COMPANY • 175 East 131st Street, Cleveland 8, Ohio


WYCKOFF
Cold Finished Steel
PRODUCTS
CARBON AND ALLOY
• Rounds ⅛" to 6½"
• Squares ⅛" to 4½"
• Hexagons (Alloy ⅛" to 3½") (Carbon ⅛" to 3⅛")
• Flats ⅛" x ¼", 2" x 12" and 1¼" x 14"
TURNED AND POLISHED SHAFTING
TURNED AND GROUND SHAFTING
LEADED STEELS
• Bessemer and
• Open Hearth Grades
SPECIAL SECTIONS
FURNACE TREATED STEELS
All Quality Controlled
TO PROVIDE MAXIMUM UNIFORM PRODUCTION IN YOUR OPERATIONS
35 Years of Specialization in Quality Controlled Cold Finished Steels
SPECIALISTS IN COLD FINISHED STEELS EXCLUSIVELY
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GENERAL OFFICES:
Gateway Center, Pittsburgh 30, Pa.
Branch Offices in Principal Cities
Works: Ambridge, Pa.—Chicago, Ill., Newark, N.J.—Putnam, Conn.



# Forming:

## High production presses double lamination output

Production of laminations for fractional hp and small hp electric motors has been increased by 130 pct per press per day, since installing press units designed specifically for high production operation.

Each of these seven autofeed presses, installed over a period of two years, produces 230,000 pieces per day (three shifts), compared to 100,000 pieces per three shifts with presses used previously.

The manufacturer, Danly Machine Specialties, Inc., Chicago, uses only carbide dies (progressive, 6-station), in the autofeeds, and reports that the performance of the new high production presses justifies the high cost of carbide dies.

### Protect Dies

Being designed and built especially for high production jobs like this one, the autofeeds have unusual rigidity to protect the dies and to reduce maintenance down-time. Die life of the carbide dies on these autofeed presses is 1,000,000 pieces between grinding, and 200,000,000 pieces total die life. The stock is 2¾ in. and 3 1/16 in. x 0.057 hot rolled silicon steel on coils for automatic feeding.

# Finishing:

## Electrolytic unit plates copper on stainless wire

An electrolytic machine for copper plating stainless steel wire, described as the first of its type in cold finishing, has been installed at Republic Steel Corp.'s Union Drawn Steel Division plant in Massillon, Ohio.

It copper plates stainless wire in diameters from 3/16 in. to ⅝ in. The copper plating normally varies from 0.0001 in. to 0.0002 in. thick. However, the copper thickness can be varied consider-

when

# PRECISION COUNTS

You Can Count

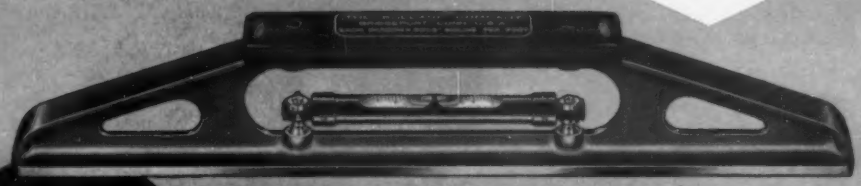
BULLARD

on a

Precision Aligning Level

Today's high standards of machining accuracy make it imperative that the machine is maintained level at all times. Among the innumerable factors that work against this condition are constant vibration, settling of buildings and floors and the molecular changes of cast iron and steel. Increase the life of machines — lower maintenance cost — by using a Bullard Precision Aligning Level.

AVAILABLE IN 12", 18" AND 27" SIZES



Check these Features

1. The vial used is made of the best optical glass, specially ground, and is filled and guaranteed by one of the greatest Level Makers in the world.

2. The vial is mounted on two brass studs, which permit adjustments in the same manner as the Level Vials on the finest surveying instruments.

3. The Bubble in the Vial has a guaranteed sensitiveness of 5 seconds of arc per graduation. This is equivalent to showing per graduation on Vial a variation of .0003 of an inch per foot.

4. The Level Casting is thoroughly insulated from the palm of the hand by means of a handle of special non-conductive material.

5. The design is the result of long experience. The casting has been seasoned, machined and scraped with meticulous care.

6. This Precision Instrument is safely protected in a felt lined box.

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

MAIL THIS COUPON TODAY —

The Bullard Company
Bridgeport 2, Connecticut

Please furnish me prices on Bullard Precision Aligning Levels . . .

CHECK HERE: 12"_____ 18"_____ 27"_____

NAME_____

TITLE_____ CO._____

ST. ADDRESS_____

CITY_____ ZONE_____

STATE_____

# Unique test furnace assures you of better end wall service

## with Kaiser Periclase-Chrome Brick

THE refractory test furnace shown at the right was designed by Kaiser Chemicals to aid in the development of superior basic refractories for the steel industry.

One of the most important of its functions is to regularly test the effect of iron oxide and steel furnace slag on various bricks—including Kaiser Periclase-Chrome Brick.

As a result of such careful quality development and control, Kaiser Periclase-Chrome Brick are superior in your furnace—assuring less spalling, less swelling, greater resistance to abrasion and alteration by oxide and slag.

Leading steel producers have found that Kaiser Periclase-Chrome Brick can greatly increase end wall life or greatly reduce wall thickness, when this is preferred.

Let your Kaiser Chemicals sales engineer show you how you can get longer life from your end walls or reduced wall thicknesses with Kaiser Periclase-Chrome Brick. Call or write any of the sales offices listed below for immediate attention to your particular problem.

Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, Calif. . . . 3 Gateway Center,* PITTSBURGH, *Pa. . . . 518 Calumet Building, 5231 Hohman Ave., Hammond, Indiana* (CHICAGO).

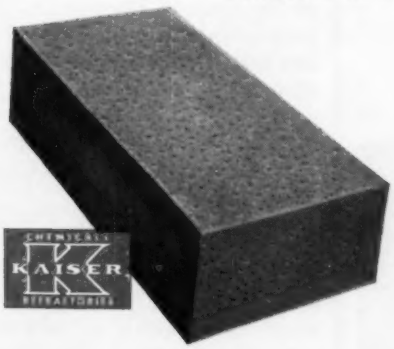
## For the ultimate in steel furnace refractories

**SOME OF THE REASONS YOU GET BETTER SERVICE WITH KAISER PERICLASE-CHROME BRICK:**

1. Chromite content is the minimum amount (only 9.1% $Cr_2O_3$) necessary to provide thermal shock resistance. Lowering of chromite reduces swelling, thus minimizes end wall buckling.
2. A ceramic bond is formed *before* the chemical bond is destroyed.
3. No liquid phase in forming its ceramic bond. Volume stability.
4. Highest MgO content in end wall brick provides greater resistance to carryover erosion and iron oxide attack.
5. Lowest porosity minimizes alteration by resisting penetration of gases and impurities.

# think of Kaiser Chemicals

**Pioneers in Modern Basic Refractories**



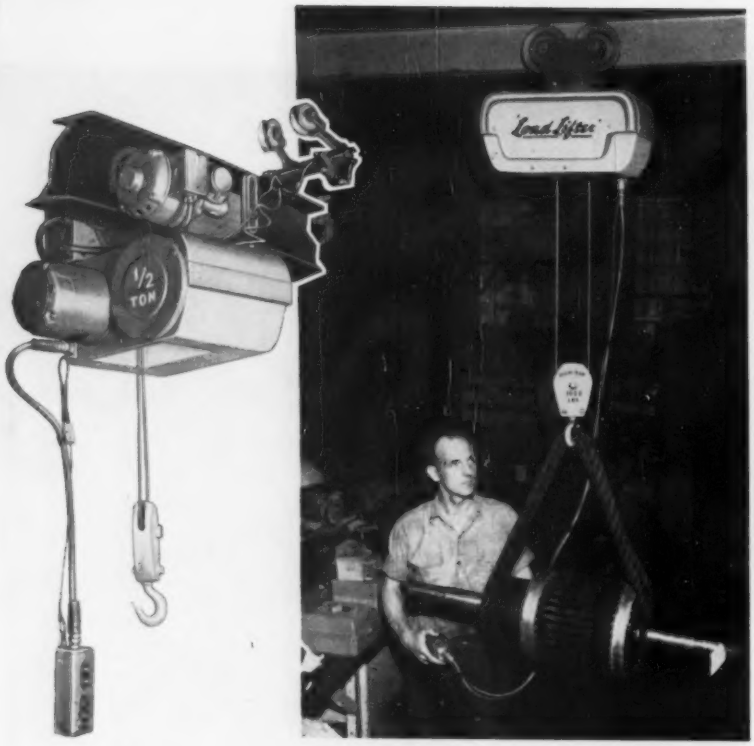

REFRACTORY BRICK • RAMMING MATERIALS • CASTABLES & MORTARS • MAGNESITE • PERICLASE • DEADBURNED DOLOMITE

## Kaiser PERICLASE Brick for the Steel Industry:

- Kaiser Periclase Brick (D-S)
- Kaiser Periclase Chrome Brick
- Kaiser Chrome Periclase Brick

***Now available!*** **A companion mortar for Kaiser D-S brick. High purity periclase composition *and* maximum workability.**

***Installation advice on request***




TOUGH TWO-BRAKE HOIST HANDLES LOADS SAFELY

Heavy-duty lifting is easy work for the Series "600" 'Load Lifter' Electric Hoist. Every part is tough and thoroughly reliable to protect man, load and hoist completely. The motor brake and the load brake act together, automatically. Each alone has the power to hold the load safely. Braking is so fast, the load doesn't drop back — accurate spotting is always assured.

The Series "600" 'Load Lifter' cuts hoisting time — lifts a ½-ton load at 30 FPM — at the push of a button. And, there are only 24 volts at the push buttons for extra safety. There is extra safety, too, in the steel suspension, rugged gearing, tough wire rope and non-fracturing hook. Construction is so simple, the hoist can be serviced in the air.

In every respect, the Series "600" 'Load Lifter' Electric Hoist gives you quality and performance that save on every lift. Capacities: ½ and 1 ton. Available in all types of suspension, including motorized trolley. *Get details from your "Shaw-Box" Distributor or write us for Bulletin 408.*

MAXWELL MANNING & MOORE INC. M&M TRADE MARK

'Load Lifter'® ELECTRIC HOISTS

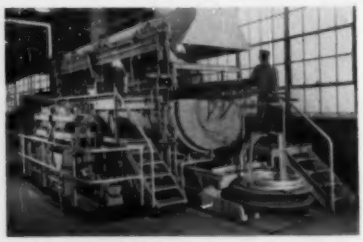
MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Makers of 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

ably to meet customer requirements.

The single strand machine gives exceptional uniformity of copper plating and eliminates the possibility of flaking. In copper plating methods used heretofore in the industry a lack of uniformity and flaking have been major problems.

Copper coated stainless steel



**Copper plate unit for wire in diam from 3/16 in. to 5/8 in.**

wire is used primarily for the production of bolts, nuts, screws and other fasteners. End products are used in the aircraft, chemical, automotive, oil refinery, atomic energy and other industries where corrosion-resistant fasteners that stand up under high temperature, critical applications are required.

## Research:

### New X-ray diffractor unit gives speed, accuracy

Perfection of a research weapon that greatly extends the ability of scientists to probe the nature of matter, to develop better materials, and to analyze unknown substances, has been announced.

Developed by the X-Ray Dept. of the General Electric Co., Milwaukee, this XRD-5 x-ray diffraction instrument uses a high-speed proportional counter and preamplifier said to free x-ray diffraction techniques from dependence on conventional Geiger counters.

As a result, states GE, a laboratory scientist can perform a considerably greater amount of work in shorter time, and still be assured of accuracy in analyzing unknown materials. The propor-

tional counter also has a life span that is described as at least 1000 times longer than that of Geiger counters.

A second outstanding feature of the apparatus is the single-crystal orienting device, which now makes it possible to routinely identify unknown organic or inorganic single crystals of matter, an important advance in the science of x-ray diffraction. In addition it permits scientists to analyze fibers and wires and study preferred orientations by the reflection method.

### 'Building Block' Feature

A third feature of the XRD-5 is the "stepping stone" or "building block" principle of its design. This permits the scientist to begin with the minimum essentials he needs for film procedures, and add components as his needs increase, until he is fully equipped with direct-measurement technics, both for diffractometry and spectrography.

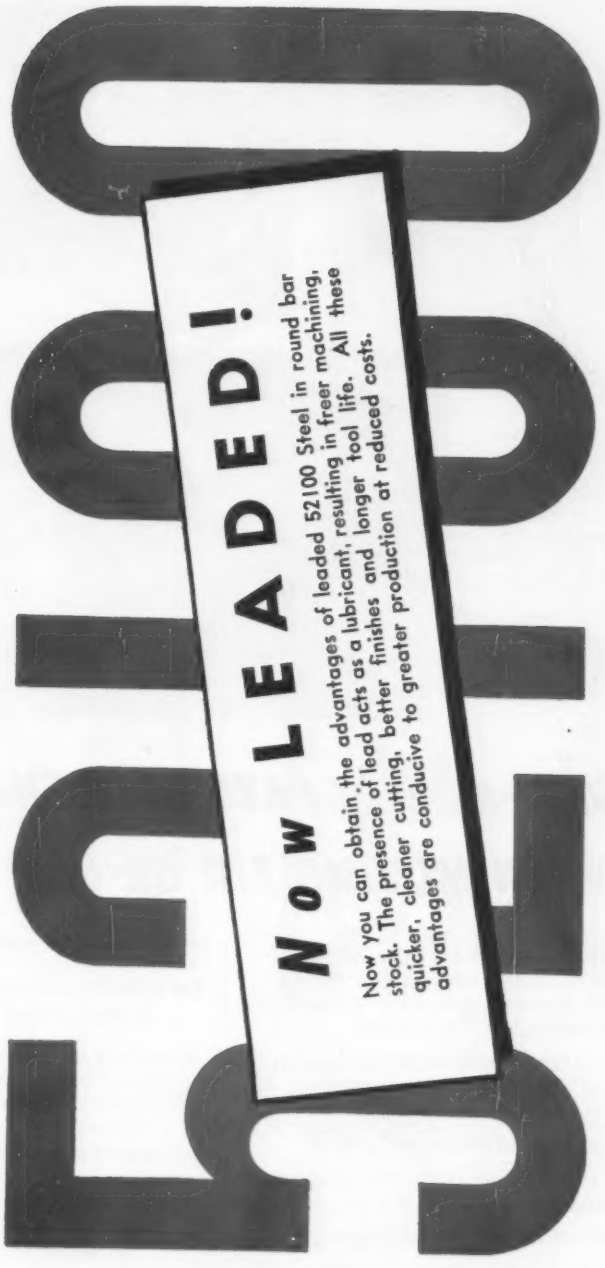
### Helium Tunnel Extends Range

A fourth feature is a helium tunnel assembly, which greatly extends the range of application for fluorescent analysis, increases sensitivity, and permits for the first time routine accurate quantitative analysis of such widely-present elements as sulphur, potassium and calcium.

A helium atmosphere is substituted for air in the path of soft x-rays emitted by small atomic number elements. This not only broadens the scope of the method but also achieves greater efficiency in counting and a saving in time required for counting.

### High Speed Detection

Armed with the high-speed of the XRD-5, the analytical chemist and physics research scientist are reported as achieving extremely high counting rates exceeding 100,000 counts per second, with a count capacity of 100,000,000. Direct count of line area even for very intense, very wide lines is possible with such capacity.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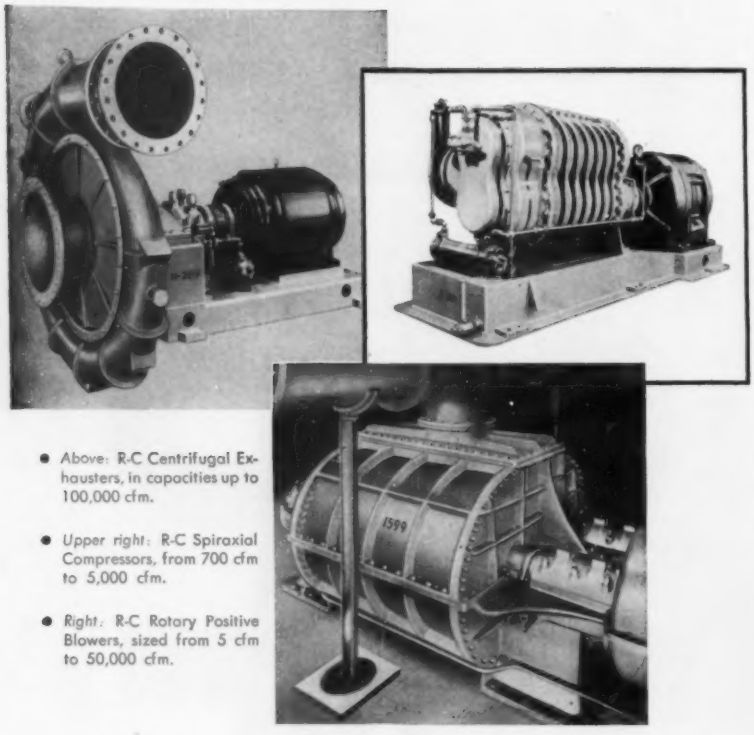

- Above: R-C Centrifugal Exhausters, in capacities up to 100,000 cfm.
- Upper right: R-C Spiraxial Compressors, from 700 cfm to 5,000 cfm.
- Right: R-C Rotary Positive Blowers, sized from 5 cfm to 50,000 cfm.

# R-C *plur-ability* PAYS DIVIDENDS WHEN MOVING AIR OR GAS

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All these factors add up to *R-C plur-ability*. They work for you in machines which you buy for your own use, or for resale with your equipment, where handling gas or air at moderate pressures is required. Our engineering experience and ability are at your service.

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Whether you use or sell equipment using gas or air at moderate pressures, check *R-C plur-ability*.

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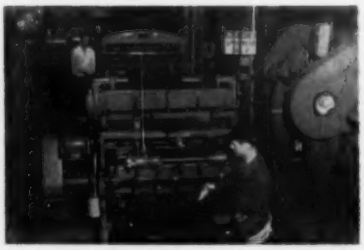
## Cutting:

### Shear line steps up auto muffler output

An important role in the production of automobile mufflers is the part being played by one of the new Union Shear lines installed at Arvin Industries' Gladstone Plant, Columbus, Ind.

Recent production figures from Arvin Industries show that the new shear line can handle, (cutting doubles), 943 pieces an hour when running 28 gage coiled steel and 825 pieces per hour when running 26 gage material.



**Shear line can handle over 900 pieces of work an hour.**

At this installation the Union Shear Line works in conjunction with a standard shear and is fully automatic. It features an air-operated shear clutch, a single, manually operated handwheel for cut-to-length adjustments and holds commercial tolerances.

The Union Shear equipment is built by the Union Tool Corp., Warsaw, Indiana.

## Metals:

### Process recovers pure zinc from galvanizers' waste

Creation of a new process that promises to conserve zinc and help overcome occasional zinc shortages has been announced by Secretary of the Interior Douglas McKay.

The process developed in a Bureau of Mines laboratory, salvages galvanizers' sal skimmings which form on the top of dipping tanks and which are skimmed off and often wasted. By using an electrolytic method, Bureau researchers produced 99.99 pct pure metallic

zinc from the skimmings and succeeded in recovering more than 90 pct of the contained zinc, according to a Bureau technical report.

**Involves Leaching**

Unlike the other zinc-bearing wastes of the galvanizing industry, largest single consumer of slab zinc, sal skimmings do not respond to smelting and distillation. Heretofore the 25,000 ton or more of skimmings produced annually have been used as a source of such compounds as zinc chloride, and their price has remained low even during zinc shortages.

The Bureau-originated technique involves leaching the skimmings with spent electrolyte and hydrocholoric acid, then placing the resulting solution in an amalgam cell where virtually all the contained zinc is recovered electrolytically.

The report cites these advantages as making commercial use of the process attractive:

**Report Available**

Extremely high purity zinc is produced in a one-step operation from a relatively impure electrolyte. No complicated electrolyte purification steps are required. Chlorine, a valuable byproduct, also is produced. Current efficiency is very high.

A copy of R. I. 5205, "Electrolytic Recovery of Zinc from Galvanizers' Sal Skimmings," by P. M. Sullivan, can be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13. It should be identified by number and title.

## Machining:

### Lever arms automatically broached at 560 per hr.

Punched holes of 7/8 in. maximum diameter in automotive lever arms are being automatically broached at a rate of 560 per hour. These lever arms are being broached on a 15 ton, 66-in. stroke Colonial pull-up machine made by Colonial Broach & Machine Co., Detroit.

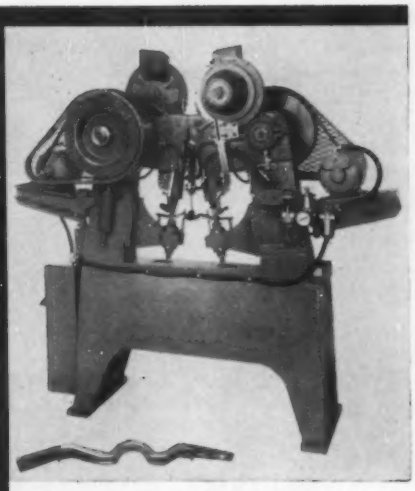
Four broaches, says Colonial,


**T-J** does your riveting and clinching

**Faster... Automatically!**

T-J Clinchors adaptable to a wide range of clinch nut setting problems. Gravity feed model shown here.

**CLINCHORS**



This T-J Special Dual Rivitor sets two rivets at a time . . . consists of two 8" throat Model R Rivitors, each with 10" hopper, special oversize anvil post, and special horn. Sample of work shown below machine.

**RIVITORS**

*Automatic feeding and setting* with T-J Rivitors and Clinchors help you reduce labor and step up SPEED in a wide range of assembly jobs for aircraft, automotive, farm machinery, stampings of all kinds.

T-J CLINCHORS set clinch nuts with fully automatic operation, controlled by a single foot pedal. Available in Underfeed and Gravity feed models, throat depths 8" to 36".

T-J RIVITORS automatically feed and set solid rivets with high production. Electrically powered Rivitor sets solid steel rivets up to 7/8" long. Air-powered sets aluminum alloy rivets or steel rivets up to 3/4" long. Throat depths 8" to 36".

Write for Clinchor bulletin 555; Rivitor bulletins 646 and 555. The Tomkins-Johnson Co., Jackson, Mich.

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**No electroplating--no mechanical finishing!**

PART AS CAST

TREATED WITH NEW IRIDITE

## NEW IRIDITE® (Cast-Zinc-Brite)

**brightens zinc die castings by chemical polishing, protects against corrosion**

**NOW, FOR THE FIRST TIME** you can get a brilliant, decorative finish directly on zinc die-cast parts . . . without mechanical finishing, without electroplating! The luster is provided by the *chemical polishing* action of new Iridite (Cast-Zinc-Brite) solution. Even surface blemishes, such as cold shuts, are brightened by this new process. No electrolysis. No special equipment. No specially trained personnel. Just a simple chemical dip for a few seconds and the job is done. And, this new Iridite has been *tested and proved* in production.

**CORROSION RESISTANCE, TOO!** New Iridite (Cast-Zinc-Brite) provides exceptional corrosion resistance for bright-type chromate finishes . . . also guards against blueing or darkening by eliminating zinc plate formerly required in bright chromate finishing of zinc die castings.

**AS A BASE FOR ELECTROPLATING**—Lower mechanical finishing costs are possible where plated finishes are *required* since the brightness provided by this new Iridite may be sufficient.

**LET US SHOW YOU what Iridite (Cast-Zinc-Brite) can do for you. Send us at least a half-dozen typical zinc die-cast parts for FREE PROCESSING for your own tests and evaluation. Or, for immediate information, call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified 'phone book. *IMPORTANT: when you give us samples for test processing, please be sure to identify the alloy used.***

Iridite is approved under government specifications.

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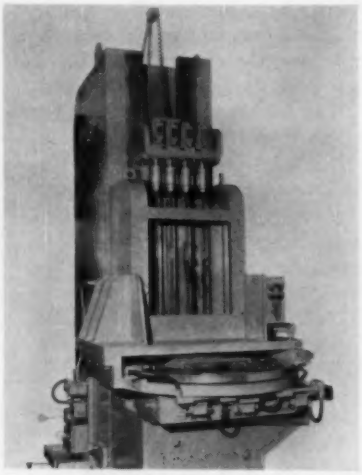
Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals

are pulled through the lever arm holes on each broaching stroke. Five different parts may be broached by mounting their corresponding set of face plates on the rotary indexing fixture. The fixture is automatically indexed by a special hydraulic circuit which is interlocked with the machine circuit for continuous operation. This feature, it is reported, permits operation of the machine at 100 pct of capacity.



**Parts are front loaded, automatically discharged at right.**

The rotary indexing fixture has three indexing positions for broaching and three indexing positions for broach return. This permits loading any of the five different parts side by side while parts are being broached in the broaching position, with the third broaching position being used for automatic unloading of the broached parts.

Lever arms being broached vary in length from 6⅜ to 8⅜ in., while the depth of broached holes is 1-1/32 in. on all five arms.

## Corrosion:

### Metal alloy coating protects ship pipes

A one-year test on a sea-going vessel has demonstrated better corrosion resistance on pipes coated with a metal alloy coating.

The tests were held aboard the *S.S. Bulk Star* by the Niphos Proc-

# ALCO Makes Steel to Assure You of Quality in ALCO FLANGES

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ALCO produces special steels not listed in standard specifications as well as steels to meet ASTM, AAR, ASME, AISI and MIL specifications. As an additional help, ALCO specialists will confer with you on proper steel selection.

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ess Sales Corp. of New York.

A standard section of pipe was coated by the Niphos Process with 0.001 to 0.002 in. of nickel-alloy, installed as a section of the heating coils in the centerline cargo tank and subjected to the severe corrosive action of hot sour crude oil and salt water ballast. This test section was in constant service for the entire testing period of one year.

### Pipe Life Extended

The *S.S. Bulk Star* had been chosen for this test by its owners, National Bulk Carriers, because this ship is subjected to the most severe corrosion losses due to carrying alternating loads of sour crude oils and salt water ballast between Arabia and England.

Normal life of uncoated mild steel heating coils without repair in this service is only 6 months, and cost of replacement has been established at over $90,000 per ship. It is estimated by the supplier that the application of a Niphos coating to these heating coils will increase the life of the pipes many years.

## Fabricating:

### Built-up plate girders give headroom

Welded girders, built up from steel plate to 190 ft in length to provide maximum headroom while using a minimum of steel, are being fabricated.

The 6 ton transverse girders provide the extra headroom between supporting columns by using stress patterns on each beam which eliminate much of the depth required with rolled beams. The shape also eliminates much of the weight and cost normally associated with rolled beams.

Double-tapered cross members, built up from plate along the same pattern, provide increased headroom between the transverse beams. The Harold Roach Construction Co. is the general contractor erecting the girders fabricated from steel plate made by the Kaiser Steel Corp., Oakland, Calif.

SUPERIOR QUALITIES
...because they're Shenango centrifugal castings. Typical, these flanged mill stand bearings of bronze have greater strength, closer-knit grain, better machining characteristics than ordinary castings. Won't such qualities pay off in the symmetrical parts you need? For helpful Shenango bulletin on centrifugally cast ferrous or non-ferrous parts, rough or finished, write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa).
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# Cleveland Drum Type Clutch
## speeds die adjustment . . . cuts production costs

These Cleveland Two-Point Presses equipped with patented Cleveland Drum Type Friction Clutch have done just that. You'll find that even the largest Cleveland Press equipped with a Cleveland Clutch is as easy to control as the smallest inclinable.

Press slide can be exactly "inched" for faster die adjustment or can be operated on a single stroke or continuous cycle with instantaneous starting and stopping. Operators have positive control at all times. Increased slide control extends die life . . . reduces stamping rejects.

**Designed with a minimum number of moving parts, there's less chance of failure with a Cleveland Clutch. When necessary, adjustments can be made right on the press. Light-weight construction reduces horsepower required for operation. Spring-loaded brake stops slide immediately in event of electric or air supply failure. To prevent die damage, clutch can be set to slip under overload.**

Install Cleveland Clutches on your older press equipment regardless of make or model. You'll get increased efficiency for lower production costs. Write or call today.

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# METALS: Columbium-Tantalum Improve Carbides

**Added to tungsten carbide in small percentages, two rare metals provide properties which are needed in high speed and high temperature metalworking . . . Tantalum cited for giving lubricity to die material.**

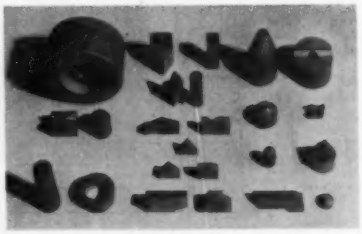
Metals that were considered rare a decade ago—columbium and tantalum—are now helping to make special materials resistant to high abrasion and high temperature conditions.

Now being made available in large quantities by Shieldalloy Corp., Newfield, N. J., the tantalum and columbium are supplied as carbides to manufacturers of carbide parts in the form of powders which are especially suitable for "compacting" into useful shapes. These ingredients are added to tungsten carbide in relatively small percentages.

Outstanding use of these refractory carbides is made by the Adamas Carbide Corp., Kenilworth, N. J., manufacturer of a wide variety of tools, cutter and blanks, bushings, dies and special purpose parts which must be resistant to abrasion, wear and heat. At the Adamas plant the tantalum and columbium carbides are mixed with tungsten carbide. The mixture of carbides is blended with cobalt powders, which later acts as the "cement" to hold the carbide particles together; then, giant power presses, using a pressure of approximately 30 ton psi, compact this power mixture into various useful shapes.

**WANT MORE DATA?**

***You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.***



**Typical parts produced from carbides with "rare" metals.**

To harden these shapes which are soft and crumbly to the touch, they are sintered in furnaces. When the parts emerge from this "presintering" treatment, they have not yet achieved their final hardness, but are hard enough to be handled. Slots, recesses, holes, and other special shapes required by the final design of the tool, are then machined into the carbide parts. They are then reheated at a much higher temperature, imparting a hardness almost as great as that of diamond. In this form, the carbide shapes are used in high speed cutting of the hardest metals, including the new high temperature alloys for jet engine construction.

### Used in Die Materials

Tantalum, and its sister metal columbium, possess much greater ductility than tungsten. This is also true of these metals in the

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carbide form. By adding small amount of tantalum carbide and columbium carbide to tungsten carbide, special properties required by high speed and high temperature metalworking techniques can be achieved. A typical example of the advantage of tantalum carbide as an additive to the tungsten carbide material can be seen in a die material manufactured by Adamas Carbide.

Used primarily for its "cold heading" properties in the manufacture of such products as bolts, this die material is wear resistant and has much resistance to the "slamming" types of impact which is encountered. This "cold heading" grade of die material contains a large percentage of cobalt —25 pct—and a small amount of tantalum; however, no columbium carbide is included. Tantalum carbide is added because of its inherent lubricity, which prevents the die from "seizing" under the extremely great impact and abrasion.

## Handling:

### Conveyor belt won't burn under metals at 1400°F

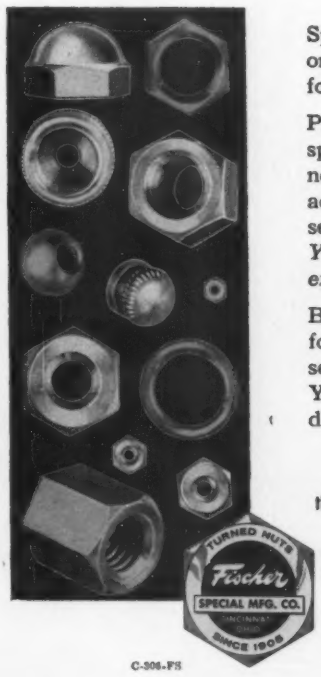
Scorching chunks of hot metal, heated to temperatures as high as 1400°F, won't burn holes through a new kind of rubber conveyor belt designed for handling hot materials.

First conveyor belt ever made with glass fabric insulation, the new construction was recently announced by Goodrich Industrial Products Co., Akron.

**Bar stock twice heated to 1400°F is placed on belt.**

These new "Fire Curtain" belts have two plies of glass fabric that "float" in the top rubber cover. The glass fabric retains its

Fischer
hatches "specials"
every day!

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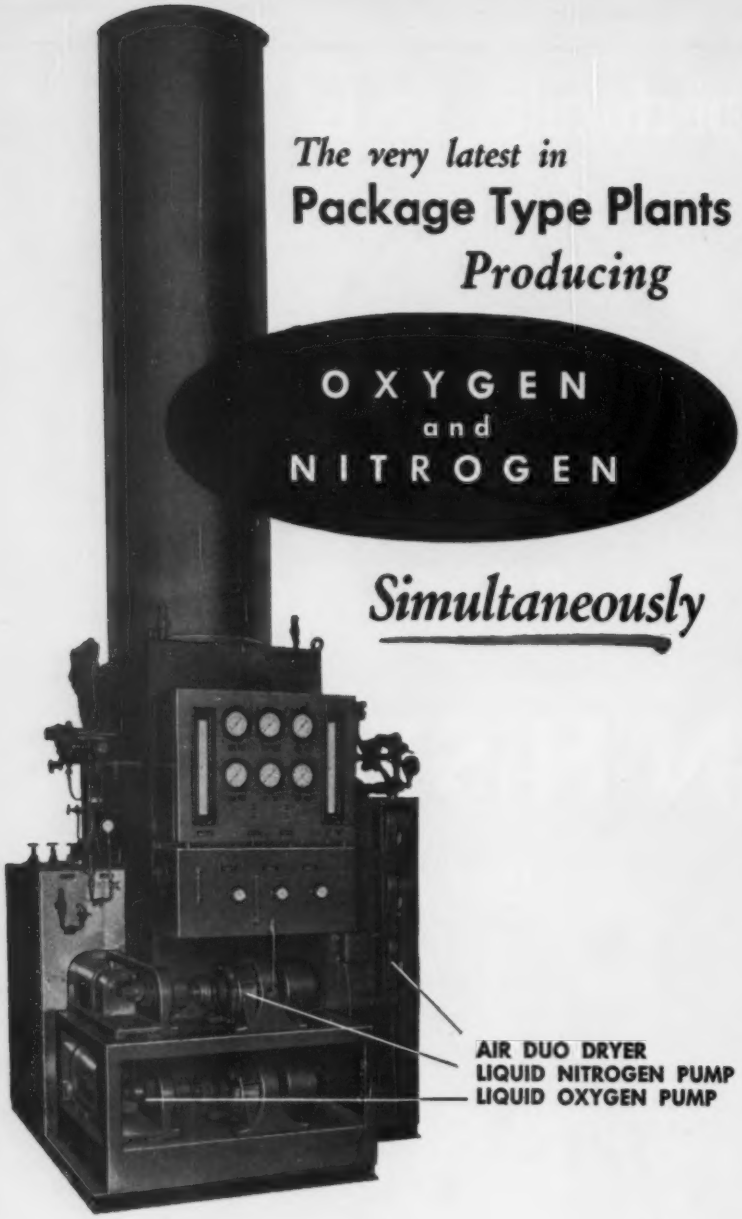


With the introduction of our latest, improved design Package Type Generating Plants, production of high purity Oxygen and Nitrogen simultaneously *increases* production 60% over the production of Oxygen alone, *plus* a corresponding reduction in the *cost* of manufacture. Due to its compact design, a minimum of floor space is required and streamlined panel assembly insures instant visibility of all control gauges. Stock sizes from 1500 to 10,000 cu. ft. per hour. Larger and smaller sizes available. 99.99% Argon available on large size plants.

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strength despite intense heat, thus barring the progress of fiery metal objects through the belt.

### Charring Only

When a hot piece of metal drops on the belt, the belt's rubber cover chars at that spot, but only as far down as the glass fabric heat barrier. Hot metal cannot penetrate the barrier and the overall strength of the belt and its cover remains as strong as ever. In conventional belts, hot metal objects burn holes clear through belts in one continuous burning action.

According to Goodrich, new "Fire Curtain" construction was developed for use in foundries where burnt holes are the major cause of belt failure. The construction is available, however, for hot material conveyor belt applications in other industries.

---

## Fabricating:

### Annealing process gives tube better finish

An improved type of hydraulic tubing, now being manufactured and distributed, undergoes a special annealing process, with controlled atmosphere, which completely treats the inside of the tube as well as the outside, the result is described as giving an exceptionally smooth, satin-bright finish.

The improvement in finish is important, especially on the inside of the tube, because it virtually eliminates oxidation, scale and other adhering foreign matter that could restrict the flow of fluid and clog hydraulic systems.

### Expected to Reduce Costs

The cleanliness of the tubing is expected to reduce fabricating and cleaning costs, while the uniform surface enables easier bending and fitting without the danger of flattening or peeling the tube cross section.

The tubing is manufactured and distributed by the Summerill Tubing Div., Columbia Steel & Shafting Co., Pittsburgh.

*Once again* ... the

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**SUPER SAVINGS** in cost of operation

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**SUPER TIGHT** machine construction

**SUPER CAPACITY** blasting wheel

**WHEELABRATOR**
CORPORATION
510 S. BYRKIT STREET MISHAWAKA, INDIANA

*World's Largest Builders of Airless Blast Equipment*

# NEW EQUIPMENT

**New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 113 or 114.**

## Machines, washes and air tests 103 parts an hr

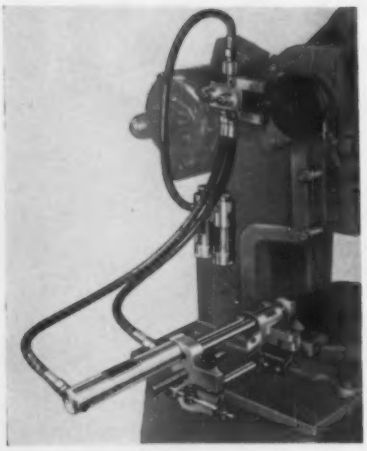
An 84-station segmented transfer machine is described as machining, washing and air testing cast iron automotive oil pump bodies at a rate of 103 pieces per hour at 75 pct efficiency. The unit features a parts distribution system which feeds finish-machined and tested parts to each of three precision boring machines. Parts are fed to these boring machines according to their rate of demand. A wide variety of drilling, milling, reaming, tapping, trepanning, boring, spotfacing, countersinking and chamfering operations are performed in the first 12 segments and 43 stations of the machine. The parts are rotated 90° and turned 90° in the sixth segment to permit the drilling, boring and milling of other plane faces. Parts are then washed at an 8-station segment and air-tested at a 2-station segment of the unit. *Snyder Tool & Eng. Co.*

**For more data circle No. 31 on postcard, p. 113**

## Electric furnace has unique handling feature

This pit-type furnace is provided with a vertical lift or elevator type closing arrangement. This permits the door, when lowered, to serve as a hearth which may be rolled to the front of the unit, in an accessible convenient location. The arrangement is described as making the unit adaptable to a wide variety of usage, especially where work to be handled involves extremely heavy parts, such as steel dies or crucibles containing molten glass or metals. The parts are easily loaded onto the hearth or door which is then rolled on tracks back to position and raised to the pit-type work chamber. The unit, incorporating silicon carbide heating elements, has an operating temperature up to 2750°F, with a heat-up period (to maximum) of three to four hours. Chamber size of the furnace is 18 in. wide x 18 in. deep x 21 in. high. Hearth or car top measures 18 in. wide x 18 in. deep. *Pereny Equipment Co.*

**For more data circle No. 32 on postcard, p. 113**



## Slide feeder for use on small punch presses

Newly designed, smaller air operated slide feed with an open throat has been built for fast, automatic feeding on small punch presses. Because of its small size and light weight, states the manufacturer, it can be easily moved from press to press or may be left mounted on die sets and conveniently stored for frequent reorders. This feed is not a spring-fed feed and no cam cutouts are necessary for its operation. The unit operates on shop air lines with 50 to 100 psi and takes material up to a max thickness of 1/16 in. and to maximum widths of 6 in. in lighter gages. The pneumatic slide feed has a maximum feed length of 3 in.; operates at 200 strokes per minute; and will feed at correspondingly higher speeds when shorter feed lengths are used. Simple to set up and accurate in operation, only one screw adjustment is necessary. While it operates off the press crankshaft, the length of the press stroke won't affect feed length. Locking action prevents over-riding. *Cooper Weymouth, Inc.*

**For more data circle No. 33 on postcard, p. 113**

# No Time Lost!

Minutes after your order is placed for warehouse steel Levinson personnel are working on cutting and shipping schedules. Because this is typical of the prompt attention given all orders, large or small, Levinson is able to deliver your steel on time.

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Warehousers, fabricators, designers of steel for over half a century

the

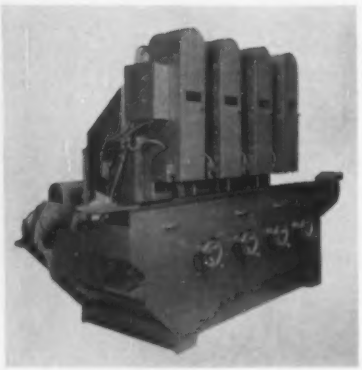
# LEVINSON STEEL COMPANY

20th & Wharton Sts.,
Pittsburgh 3, Pa.
Phone: HUbbard 1-3200

## New cut-off unit handles rod, bar and tubing stock

This cut-off machine is available for use with a dry-cutting abrasive wheel for cutting rod, bar and tubing stock. The same machine may also be used with high-speed saw blades and with conventional wood-cutting blades. The unit is available with an air feed attachment for repeated production operations. It's a pneumatic device, described as requiring no electrical connections and capable of installation without machining. The attachment can be used in connection with either automatic stock feed or hand feed. The cut-off unit's heavy cast iron table comes drilled so that the head may be mounted at 45° for mitering and the table may also be drilled and tapped for any desired work holding devices. The machine takes abrasive wheels and saw blades up to 12 in. in diam. Blades or wheels are guarded by a heavy cast iron guard which manufacturer claims provides 216° peripheral protection to the operator. A 3 hp, 220/440 v, 3-phase motor supplied with the machine is totally enclosed. An automatic spray coolant system which supplies coolant to the blade while cutting is also available. *Walker-Turner, Inc.*

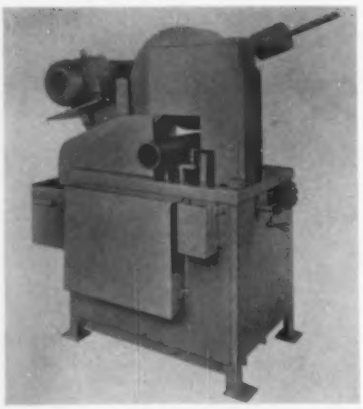
For more data circle No. 34 on postcard, p. 113



## Four-head belt grinder for micro-inch finishes

Designed for high-volume flat surfacing of ferrous and non-ferrous metals as well as for other materials, this new contact-wheel abrasive belt machine permits four simultaneous grinding operations. It is described as producing extremely fine micro-inch finishes to exacting tolerances and making possible a single-cycle operation from rough casting to polished part. Typical multiple grinding sequence, using a series of progressively finer belts is: rough grind, two semi-finishes, and finish grind. One pass under the four heads can remove an approx max of 0.020 in. of steel stock and up to 0.060 in. for other materials and applications. The unit has a max piece capacity of 5 in. high, 6 in. wide with any length. The machine is 125 in. long, 51 in. wide and 90 in. high. It weighs 5500 lb. Magnetic chucks are optional equipment. *Engelberg Huller Co.*

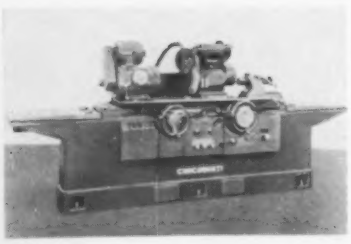
For more data circle No. 35 on postcard, p. 113



## Dry-abrasive cutter incorporates oscillating feature

Described as of heavier construction than previous models, this high-speed dry-abrasive cutting machine has a capacity to handle solid steels up to 4 in. sq, 6 in. angles and 8 in. channels at 90° to axis. The device is available in both stationary and portable models for cutting sheets, angles, channels, pipes, bar stock, tubes and solids of practically all analyses. The machine is an oscillating type unit in which the wheel and work are fed manually. With oscillation, the maker states, the amount of abrasive wheel contact is reduced and cutting is performed with a minimum of pressure on the wheel. A double-acting work holder automatically positions the material being cut in the center of the support and is clamped at both sides by a hand-operated crank handle. The unit measures 56 in. front to back, 32 in. left to right, 62 in. high. Net weight is 1200 lb without electrical units. *American Chain & Cable Co., Inc.*

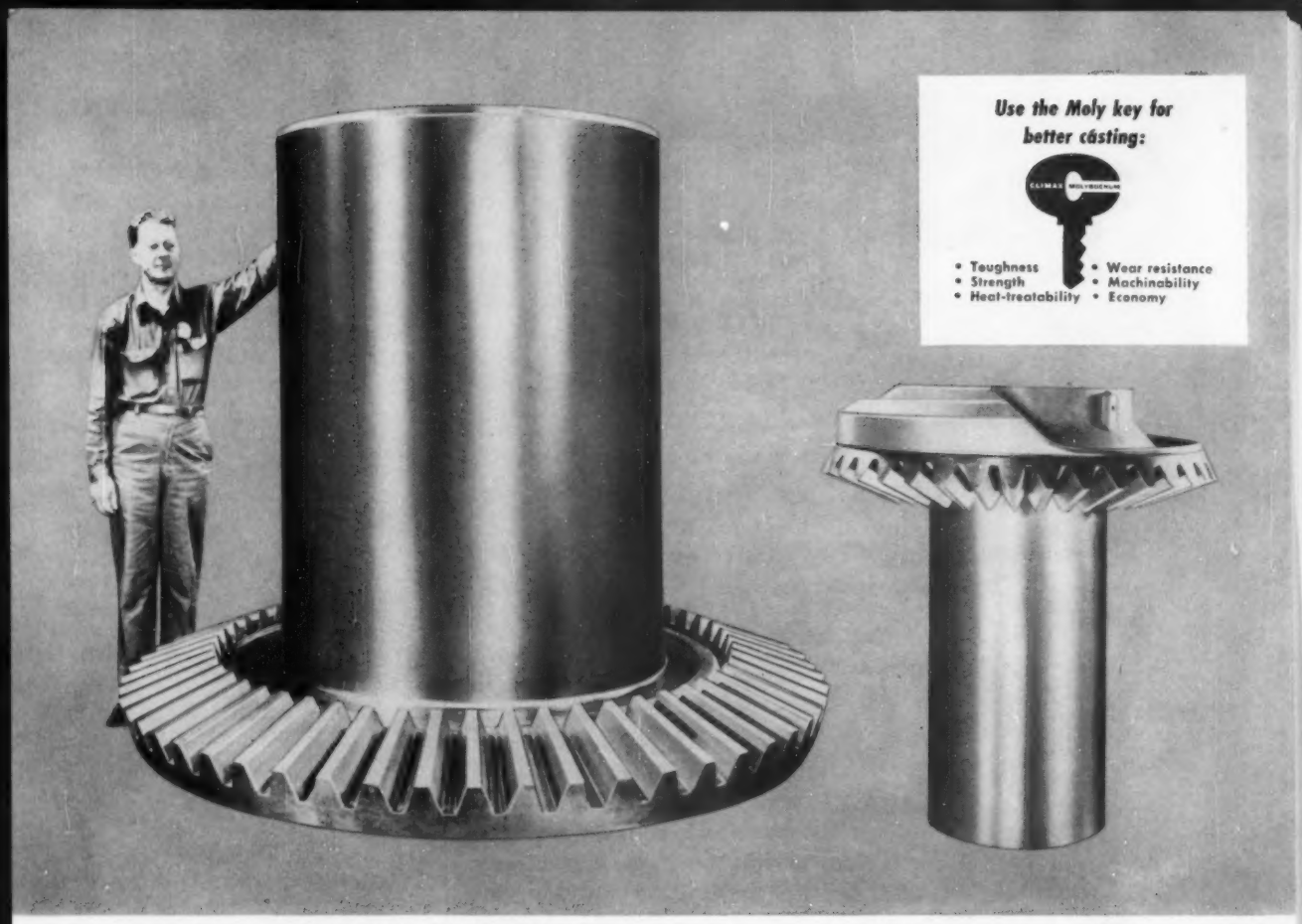
For more data circle No. 36 on postcard, p. 113



## Universal grinders have self-adjusting bearings

Self-adjusting bearings for heavy roughing cuts or light finishing cuts are a feature of this firm's new 12, 14, and 18 in. universal grinding machines. The company's Filmatic bearings have been retained for the grinding wheel spindle. Multiple segments support the spindle accurately and rigidly on high pressure, wedgeshaped film of oil. Lubrication of the spindle bearings is automatic and positive. An automatic cut-out is provided to stop the spindle drive if lube pressure fails. *Cincinnati Grinders, Inc.*

For more data circle No. 37 on postcard, p. 113

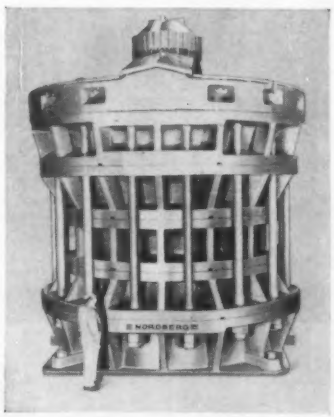



Heavy duty ore crushing machinery is subjected to severe operating conditions. To meet these strenuous requirements the gears shown are made from heat treated low-alloy manganese-*Molybdenum* steel castings. At left: a Symons Gyratory Crusher gear; right: a Symons Cone Crusher gear. Built by Nordberg Mfg. Co.

# Cast Manganese Moly Steel contributes strength and toughness to Crushers built by Nordberg

**"Where high strength and toughness are prime considerations," says Howard Zoerb, Consulting Engineer of the Nordberg Crusher Division, "molybdenum bearing steels are specified. This is true of the heavy duty parts of Symons® Crushers, built by Nordberg. These steels have contributed to the Nordberg reputation as producers of dependable, heavy duty crushing machinery."**

Technical assistance is available to foundries on alloying problems. Please address inquiries on your foundry letterhead to: Climax Molybdenum Company, Department MF2, 500 Fifth Avenue, New York 36, New York.



The Symons Cone Crusher is a product of Nordberg Manufacturing Company.

**CLIMAX MOLYBDENUM**

35% NICKEL

DURALOY

15% CHROMIUM

Furnace Castings

*Here are two good examples of our work in high-nickel castings!*

Heat Treating

These are in the Duraloy HT group calling for Ni 33.37 percent. We've gone as high as 68% nickel on some castings where extremely high temperatures and very severe corrosive conditions had to be resisted. The important factor concerning castings for exceptionally high temperatures is that they must retain their structural form under load.

Knowing just how much nickel to put in and how much chromium and other alloying elements depends to a large extent on experience . . . and it is experience that we can offer you for the castings you need. We've been producing static castings since 1922 and centrifugal castings since 1933, being among the pioneer founders in each class.

**If you would care to have our metallurgist study your casting problem, we shall be glad to have you call upon us for the service.**

Carburizing

*Our New General Catalog is yours for the asking.*

THE DURALOY COMPANY

OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue



## All-electric cut-off unit

An all-electric, packaged unit, this cut-off machine is described as rapidly and economically cutting bars and insulated wire, spaghetti tubing and plastic tubing to predetermined lengths. Capable of handling materials up to ⅜ in. in diam, it can, by turning a hand-

screw and removing and replacing switch actuating buttons, be adjusted to cut lengths from ¾ in. up to 13 in. The unit draws the material directly from a spool and automatically cuts until the spool is empty. Then it shuts itself off. *Black & Webster, Inc.*

**For more data circle No. 38 on postcard, p. 113**

## Automatic weld head

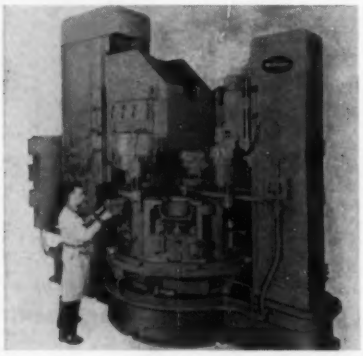
The Model C Heliweld automatic head provides a completely automatic weld cycle. A single switch causes the holder to move downward and start the arc. Arc length is maintained constant throughout the weld. Electronically controlled, the unit is primarily designed for welding with argon or helium shielding gases or a mixture of the

two. The assembly consists of a head with a 32 in. long machine holder which accommodates electrodes from 0.040 in. to 5/32 in. diam up to 24 in. long, a main control panel and a remote control operator's station. *Air Reduction Sales Co., Div. of Air Reduction Co., Inc.*

**For more data circle No. 39 on postcard, p. 113**

### Drilling machine

This clutch housing unit drills, chamfers, rough and finish bores the starter hole; reams 2 dowel holes; spot faces 4 inside bosses; and taps 5 holes in a V-8 clutch housing. It's designed to complete 120 clutch housings per hr, and with just a few tool changes, it handles 2 models on the same ma-



chine. The unit features 6 work stations, power clamping, elevating type features and a unique method for the disposal of chips. Mounted to the periphery to the index table are chip paddles, which deliver the chips to a single trough at the rear of the machine. *Michigan Drill Head Co.*

**For more data circle No. 40 on postcard, p. 113**

### Industrial glove

A new industrial glove is made of a non-absorbing butyl rubber compound designed to protect the hands from the most destructive acids. It is a one-fingered model with seam and crotch reinforced. Glove is light green in color and has a rough, stippled finish. Tested under actual working conditions, it proved resistant to such agents as sulphuric, nitric and phosphoric acids, oxygen, ozone, oils and salts. *B. F. Goodrich.*

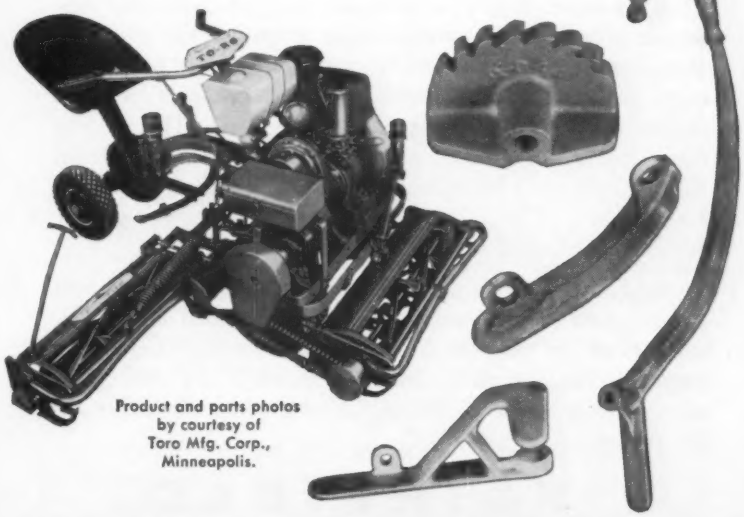
**For more data circle No. 41 on postcard, p. 113**


# How About Malleable?

**For tough service in heavy duty equipment, prominent manufacturer chooses malleable iron**

Products that must be rugged and durable — like the important lawn maintenance machine below — are "naturals" for the application of malleable iron castings. This is an example of using malleable for a number of its advantages — sturdiness, uniformity, machinability, economy and appearance.

It pays you to find out how malleable foundry engineers can help you with ideas for cost-reducing and better design. Write to Malleable Founders' Society for copies of "Malleable Iron Facts" and name of your nearest malleable foundry.



Product and parts photos by courtesy of Toro Mfg. Corp., Minneapolis.

Malleable FOUNDERS' SOCIETY

1800 Union Commerce Building Cleveland 14, Ohio

"FAIRFIELD for FINE GEARS"

WHAT **FAIRFIELD**
**Experience MEANS TO YOU**

Experience is the "plus value" that goes into every Fairfield gear *at no extra cost.* It is your assurance of dependable gear performance combined with the utmost in production economy. By specializing exclusively in "Fine Gears Made to Order" for more than thirty-five years, Fairfield has become one of America's largest independent producers of these parts. This is why many makers of Construction Machinery . . . Agricultural Implements . . . Machine Tools . . . Material Handling Equipment . . . Trucks, Tractors, and Buses now regularly depend on Fairfield to meet their requirements.

Fairfield's facilities are unexcelled. Here, in a new and ultra-modern plant you will find a complete metallurgical department, batteries of the most modern machines, testing laboratories, latest heat treating equipment—all operated by skilled craftsmen working under expert engineering supervision. *For the Best in Gears, Specify Fairfield!*

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MANUFACTURING CO.

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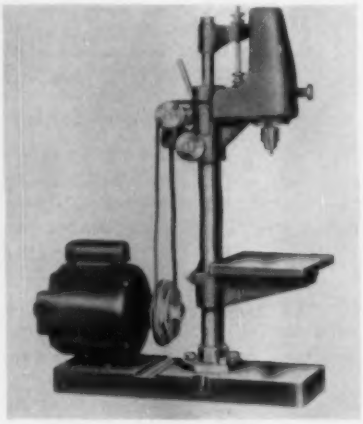
Indiana



## High speed drill

A new high speed drill is available with two drives, giving spindle speed ranges of either 2450, 2815, 3080 and 3540 rpm or 2450, 3630, 4810 and 6000 rpm. It drills to the center of a 6 in. circle, and has a



9/16 in. diam spindle with a spindle feed of 2¼ in. The unit comes with a 5⅝ in. round table. Optional 6 in. x 8 in. rectangular table overlaps base to form continuous work surfaces when set up in gangs. *High Speed Hammer Co., Inc.*

For more data circle No. 42 on postcard, p. 113

## Overhead stacker crane

Designed for use wherever a highly flexible and versatile crane is desired, this unit consists basically of a double-girder bridge with a telescoping type, fork-lift stacker trolley. According to the manufacturer, the new crane utilizes the same principle of stacker column suspen-

sion developed for modern truck and crawler cranes. Revolving a full 360°, the frame that holds the column is supported by high-capacity hook rollers that fit into a precision-machined roller bed. Both floor and cab-operated units are available. *All-State Engineering Co.*

For more data circle No. 43 on postcard, p. 113

## Induction generators

The new C series of electronic induction generators incorporate a tank circuit which increases power efficiency beyond the Curie point of steel and to as high as 200 pct for nonferrous metals. There are three frequency ranges—low, medium and high. The units are available in seven sizes, ranging from 10 kw to 50 kw of power output. They are furnished in totally enclosed cabinets having completely rubber-gasketed, hinged, double-access

doors on both sides. Cabinets have no louvers or filter openings and an integral cooling system recirculates the air throughout the generator, while providing positive pressurization. A self-contained water-to-water heat exchanger gives complete cooling of components by the recirculation of distilled water. A check light system indicates any abnormal operating conditions. *Induction Heating Corp.*

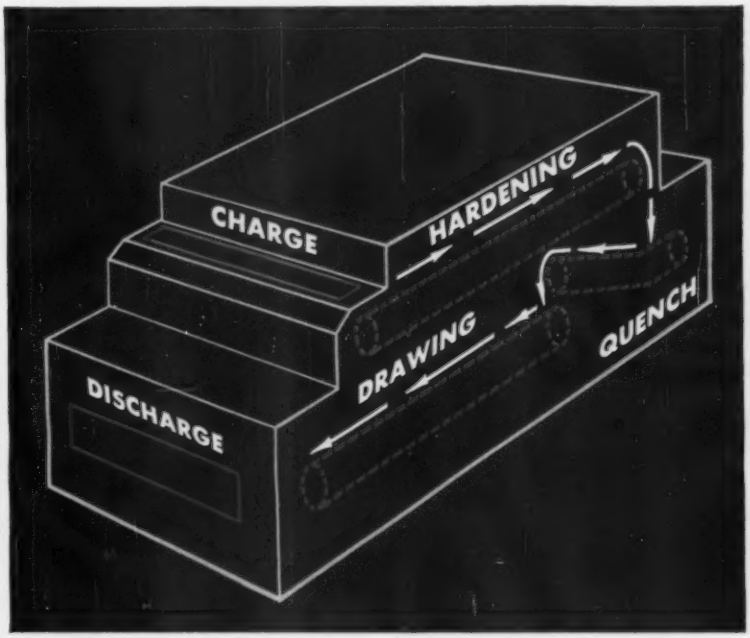
For more data circle No. 44 on postcard p. 113

## Bearing compound

A new powder metallurgy compound has been made available for the production of oil-retaining bearings. Composed of approximately equal parts of iron and bronze, it is described as combining the economy and strength of iron with the anti-friction and long-life properties of bronze. Intended as a general-purpose bearing material, it can also be fabricated into sintered parts. *Bound Brook Oil-Less Bearing Co.*

For more data circle No. 45 on postcard, p. 113

BLAZING THE HEAT TREAT TRAIL WITH HOLCROFT




LET'S TALK ABOUT
DOUBLE DECK FURNACES

Ever try to fit two entirely different furnaces into floor space where only one will go? It can be done. All you do is *stack one on top of the other!*

Holcroft did it first a good many years ago. The furnace illustrated—by no means the first of its type—was built for a Detroit automobile plant back in 1932.

Three thousand pounds of connecting rods and spindles each hour were treated—moving first through a hardening furnace on the upper deck and then down a chute into a quench tank. Work was elevated by means of a reverse conveyor from the tank and loaded onto the return conveyor belt of the lower furnace for drawing and discharge.

Furnaces like these can be fully automated, or have manual transfers. They can be designed to heat treat a specific part, or to be used for general production.

This is the kind of heat treat background and creative engineering that is available to you when you come to Holcroft. It's a good idea to do it—*today!*

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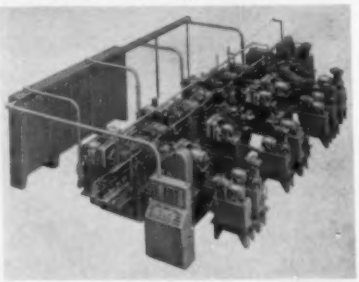
6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE
CHICAGO, ILL. • CLEVELAND, OHIO • DARIEN, CONN. • HOUSTON, TEXAS • LOS ANGELES, CALIF. • PHILADELPHIA, PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

## Twelve-station unit performs 62 operations per hr

Sixty-two operations are performed per hr on 200 torque converter housings by this 12-station, 42-ft long transfer unit. Operations performed include 36 drilling, 2 combination drilling and reaming, 7 countersinking, 2 reaming, 1 boring, 7 inspection and 7 tapping. The 12 stations are 1 for loading, 7 for machining (including 1 for mechanical inspection), 3 for visual inspection and 1 for unloading. The unit's features include: sectionalized bases to simplify processing changes, automatic depth-inspection of all holes before tapping, automatic lubrication of moving parts and mist lubrication to spindles. *Buhr Machine Tool Co.*



For more data circle No. 46 on postcard, p. 113

## Steel build-up material available in electrode form

An advanced foundation material for building up carbon steel parts preliminary to hardfacing is now available in an electrode. The electrode is alloyed to resist plastic deformation, upset and over-roll even under the severest working conditions and is effective in eliminating spalling of expensive overlay alloys. It is made for application as the first step in retreading carbon steel parts which have become excessively worn and is intended to be overlayed with a harder alloy. It is recommended for rebuilding steels containing 0.35 pct to 0.90 pct carbon, including those alloyed with chromium, nickel and molybdenum. *All-State Welding Alloys Co., Inc.*

For more data circle No. 47 on postcard, p. 113


**Something new has been added to the "Coffee Klatch"**

The Silex Company, noted manufacturers of vacuum coffeemakers, selected Hendrick Perforated Metal to fabricate this popular two-unit coffee-casserole warmer. Hendrick Perforated Metal not only adds to a product's attractiveness but it increases its saleability as well. You can select from hundreds of attractive designs in commercially rolled metals and gauges to suit your most exacting requirements. Available with round, square, diamond hexagonal or slotted perforations in plain or panel effects.

SEE OUR CATALOG IN SWEET'S

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37 Dundaff Street, Carbondale, Pa. • Sales Offices in Principal Cities
Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro-Dehazer


## Automatic feeder

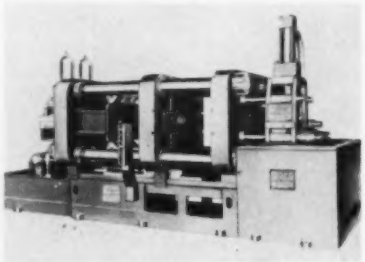
Operated entirely on a small amount of compressed air this feeder is described as offering greatly increased production. The model shown is equipped with a table inclined 30° to operate with an inclined press. The table can be lowered or raised to adjust to new die levels. Tables are available for feeding to flat bed

presses and shears. Jaws which grip the work can be modified to push plates into a variety of dies. Feeder is designed to be operated with any press or shear. Machine can be made to run semi-automatically by throwing two valve levers. *Pollasky Eng. Co.*

For more data circle No. 48 on postcard, p. 113

## Die cast unit

A new 1000 ton diecasting machine is making a one piece auto grill weighing 26 lb as cast and measuring 59 in. x 12 in. An aluminum rotary grass mower cover 24 in. sq is another product being produced. The machine weighs 79,000 lb, and has 10 in. thick solid steel die plates



each weighing over 10,000 lb. It is capable of injecting up to 49 lb of zinc and more than 14 lb of aluminum into the die with only the movement of electric push buttons required for a fully automatic cycle of operation. Hydraulic system provides fast cycle. *Kux Machine Co.*

For more data circle No. 49 on postcard, p. 113

## Corebreaker

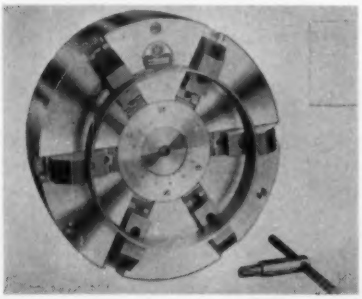
An all-forged corebreaker weighs only 22 lb and is 19 in. long which makes it easy to hold and operate. Operator fatigue and maintenance costs, the maker states, are kept to a minimum by use of an air-cushioned piston hammer which pro-

duces a powerful blow with little vibration. The unit operates on 80 to 95 psi and uses little air. Another feature of the corebreaker is one-bolt retainer construction, allowing quick and easy chisel changes. *Le Roi Div., Westinghouse Air Brake Co.*

**For more data circle No. 50 on postcard, p. 113**

## Universal chuck

Recently introduced is this new lightweight six jaw universal chuck with controlled centering pressure. Its adjustable centering feature operates rapidly and accurately to center the workpiece without distortion due to overtightening. The action is accomplished by setting the holding pres-

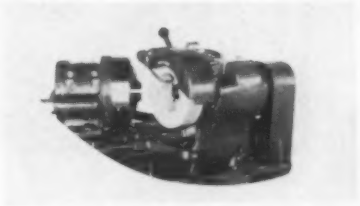


sure desired on a calibrated plate in the center of the chuck. The six universal jaws are then brought into the piece simultaneously until contact is made and the preset pressure is reached. At this point, jaws stop. *Horton Chuck Div. of the E. Horton & Son Co.*

**For more data circle No. 51 on postcard, p. 113**

## Wet drill pointer can supply coolant two ways

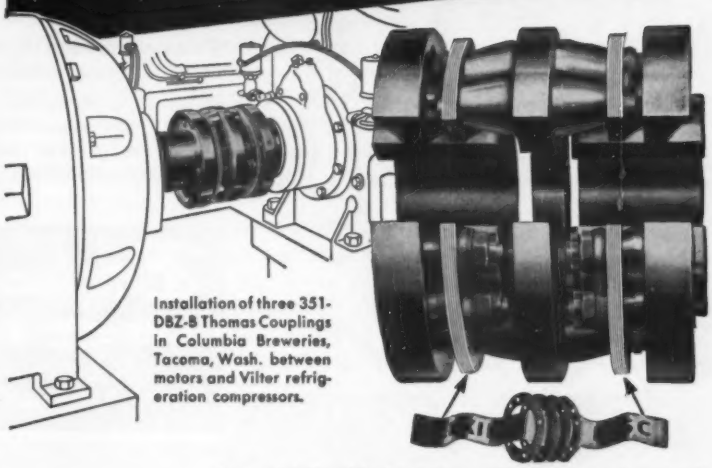
A semi-automatic wet drill pointer is now available with two alternative methods of supplying the coolant to the tool area being ground. Conventionally coolant is discharged directly to drill point surface. First alternative method is the substitution of "water through the wheel." Second is combination of conventional and first alternate—permitting a flow to both surface and the tool being ground as well as



"through the wheel." *Oliver Instrument Co.*

**For more data circle No. 52 on postcard, p. 113**

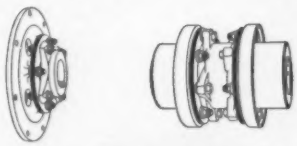

**THOMAS FLEXIBLE COUPLINGS...**
**for more years of better service!**



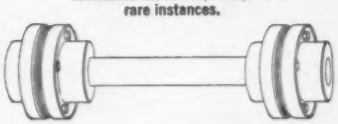
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

**Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.**

| DISTINCTIVE ADVANTAGES | |
|---|---|
| FACTS | EXPLANATION |
| NO MAINTENANCE | Requires No Attention. Visual Inspection While Operating. |
| NO LUBRICATION | No Wearing Parts. Freedom from Shut-downs. |
| NO BACKLASH | No Loose Parts. All Parts Solidly Bolted. |
| CAN NOT "CREATE" THRUST | Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement. |
| PERMANENT TORSIONAL CHARACTERISTICS | Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained. |



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

*Write for our new Engineering Catalog No. 51A*

**THOMAS FLEXIBLE COUPLING COMPANY**
***Largest Exclusive Coupling Manufacturer in the World***
**WARREN, PENNSYLVANIA, U.S.A.**

# How BRAINARD STRAPPING SERVICE saved 89% on shipping cost

**PACKAGE COST** for shipping these concrete "edgers" was cut 89% at the Heltzel Steel Form & Iron Company by converting from expensive wood crates to corrugated cartons strapped with ½" Brainard .015 strap. Other savings:

***LOWER FREIGHT COSTS***

Strapped carton weighs 19 pounds less.

***FASTER OPERATION***

One man does job of two required in former operation.

***EASY STORAGE***

Two cartons displace one wood crate, which frequently warped with changing weather conditions.

This cost-cutting operation was recommended by a Brainard strapping expert. No matter what you make, package or ship, a nearby Brainard representative can show you the way to similar savings. Call him today, or write:

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SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

**THE BRAINARD STEEL DIVISION**
**of the Sharon Steel Corporation**
**Dept. I-5, Griswold St.**
**Warren, Ohio**

**MAKERS OF QUALITY STEEL STRAPPING**

STEEL OUTLOOK

Markets and Prices

# The Iron Age SUMMARY . . .

**Export market could be steel's ace-in-hole should demand falter . . . Steel leaders disagree on customer inventory build-up . . . Active conversion market in plates.**

**Ace In Hole** . . . The "forgotten man" in the steel market picture is export. This could be an ace-in-the-hole should domestic demand falter.

But the tip-off on the strength of U. S. demand is that steel producers are avoiding heavy export commitments. Even those who are talking about a third quarter letdown are not going out of their way to court the foreign consumer.

It's estimated that exports to Europe and other foreign consuming areas will total slightly more than the 4.4 million tons shipped abroad last year. Chances are the 1956 total would be a lot more—if U. S. mills could spare the steel.

A check on foreign inquiries indicates that well over a million tons of potential orders are going begging here. Big drawback is that much of it is in hard-to-get products such as plates and structurals. Backlogs of foreign mills are heavy and reconstruction work in Europe is suffering for lack of needed steel items.

**Inventory Question** . . . Since steel producers themselves disagree on whether consumers have built heavy inventories, it's questionable whether a third quarter letdown, if any, will be of any significance. A slowdown in third quarter production will be due as much to vacations and hot weather as to any lack of business.

Disagreement among steel leaders over the need for an immediate price increase is deep-seated. Public sounding off on the subject is more than window dressing. Nevertheless, no general price boost is likely until after the settlements with steel labor. By that time, tempers may have cooled.

Meanwhile, prices of scattered steel products have been advancing since late last year. Tinplate price increases become effective this week, and prices of certain tubular products, including boiler tubes, are moving up.

**Order Volume** . . . Volume of new business is still ahead of shipments. Even in the case of cold-rolled sheets, those mills whose output is heavily weighted with this item show a full order book—and plenty of bookings for third quarter.

Whereas the pressure last year was on flat-rolled, the shoe is now on the other foot—structurals and plates. There is an active conversion market in both, and premium prices up to $200 a ton or more are being paid. Some mills are quietly producing light plate on sheet and strip mills to help ease the shortage—and to take up the slack where sheet and strip has eased.

## Steel Output, Operating Rates

| Production | This Week | Last Week | Month Ago | Year Ago |
|---|---|---|---|---|
| (Net tons, 000 omitted) | 2,425 | 2,473 | 2,450 | 2,328 |
| **Ingot Index** | | | | |
| (1947-1949=100) | 151.0 | 153.9 | 152.5 | 144.7 |
| **Operating Rates** | | | | |
| Chicago | 100.5 | 99.0 | 99.0 | 99.0 |
| Pittsburgh | 103.0 | 106.0* | 101.0 | 99.0 |
| Philadelphia | 105.0 | 105.0 | 101.0 | 95.0 |
| Valley | 98.0 | 93.0* | 99.0 | 98.0 |
| West | 104.0 | 105.0 | 101.0 | 97.5 |
| Detroit | 98.0 | 100.0 | 82.0 | 94.0 |
| Buffalo | 105.0 | 105.0 | 105.0 | 105.0 |
| Cleveland | 102.5 | 106.0* | 102.0 | 101.0 |
| Birmingham | 23.5 | 96.0 | 93.0 | 93.5 |
| S. Ohio River | 93.0 | 97.0* | 88.0 | 95.0 |
| Wheeling | 106.0 | 96.0* | 102.0 | 99.0 |
| St. Louis | 94.0 | 97.0 | 95.0 | 106.0 |
| Northeast | 93.0 | 94.0 | 92.0 | 104.0 |
| **Aggregate** | 98.5 | 100.5 | 99.5 | 96.5 |

*Revised

## Prices At A Glance

(cents per lb unless otherwise noted)

| | This Week | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| **Composite price** | | | | |
| Finished Steel, base | 5.179 | 5.179 | 5.179 | 4.797 |
| Pig Iron (Gross Ton) | $60.29 | $60.29 | $57.71 | $56.59 |
| Scrap, No. 1 hvy (gross ton) | $55.00 | $55.50 | $53.67 | $35.00 |
| **Nonferrous** | | | | |
| Aluminum ingot | 25.90 | 25.90 | 25.90 | 23.20 |
| Copper, electrolytic | 46.00 | 46.00 | 46.00 | 36.00 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 14.80 |
| Magnesium | 34.50 | 34.50 | 33.25 | 29.25 |
| Nickel, electrolytic | 64.50 | 64.50 | 64.50 | 67.67 |
| Tin, Straits, N. Y. | 98.375 | 98.75 | 100.375 | 91.125 |
| Zinc, E. St. Louis | 13.50 | 13.50 | 13.50 | 12.00 |

# J & L Looks Over Stainless

**But it will be 1957 before production rolls . . . If decision goes through, the company will produce its own and not buy semi-finished from another basic producer.**

◆ IT WILL BE 1957 at the earliest before Jones & Laughlin Steel Corp. gets into production of stainless steel, assuming the company goes through with plans now in the talking stage.

Reason for this is that stainless production likely would be concentrated at the J. & L. Cleveland operations, where two electric furnaces will be installed. These furnaces are scheduled for completion in early 1957. Net capacity gain at Cleveland will be 400,000 tons.

At the outset, stainless production would be limited to flat-rolled. Should the company decide to go into other shapes, new facilities would have to be installed at Cleveland; either that or rolling would be done at other plants.

At any rate, J. & L. intends to produce its stainless from scratch; it would not buy semi-finished from another basic producer.

The piecemeal advance of steel prices continues. National Tube Div. of U. S. Steel Corp. has increased large diameter pipe, sizes 14 in. through 36 in., an average of approximately 3 pct. Prices also were increased on small diameter standard and miscellaneous line pipe, principally in lighter than standard wall thicknesses.

National Tube announced that discounts on 2 in. seamless pipe were reduced by 2½ points (higher price) on standard and extra strong. Boiler tube prices were boosted an average of 3 pct per 100 ft, carload lots.

Also announced was a 3 pct average price increase in pressure and mechanical tubing, and "certain items" of oil country goods, principally drill pipe and higher grades of casing.

Meanwhile, plates and structurals continued to set the market pace.

SHEET AND STRIP . . . **Pittsburgh** mills are making every attempt to clean up carryovers in order to have them at a minimum when price increases come. In most markets, speculation hinges on automotive plans. In **Cleveland**, mills are receiving tentative orders for new sized sheets for 1957 models, with provision that they can change sizes if they get the word before rolling. Preliminary experimental runs are being made on new dies and results will determine exact size. Most inventory building talk also involves automotive. In **Chicago**, mills now believe that cold-rolled will stay tight through fourth quarter. In **Detroit**, third quarter appears to follow second quarter pattern, although there is some speculation about model change easing.

BARS . . . **Chicago** mills keep talking about a third quarter drop in bar orders, but facts don't appear to bear this out. Even cold-finishers are working at top speed. Allotments are the rule for third quarter in **Detroit** in view of heavy carbon bar demand. Business there for stainless and cold-drawn is good, but not spectacular. On the **West Coast** the auto industry is placing heavy orders again and demand is well ahead of mill capacity.

PLATES AND STRUCTURALS . . . In **Pittsburgh**, it looks like freight car and construction demands will keep pressure tight through third quarter. Characteristic of the tight demand is the scrambling mills themselves are doing for their own construction plans. Some **Cleveland** mills, for example are sacrificing sheet production to use sheet mills for plate to go into mills' own expansion programs or for trading purposes for structurals. **West Coast** is hard pressed to keep up with construction demand. Carryovers for plate and structurals in **Chicago** is as high as 60 days, dependent on mill and type of material. Increasing tank demand helps tighten pressure. **Chicago** also observes fair quantities of foreign and conversion plate, as well as light foreign structurals.

WIRE PRODUCTS . . . Mills report that merchant wire is off, because of slump in farm buying. But despite agricultural slowdown, total wire output in **Chicago** mills is running ahead of last year. Nail output in upper **Midwest** is running ahead of last year, though further south the building rate has slackened somewhat. Boom in fabricated wire mesh for construction is pyramiding in **Cleveland** and commercial construction needs will keep the mesh market tight through November in **Chicago.**

ALLOY AND STAINLESS . . . **Cleveland** producers are seeking all the defense rated business they can get in order to get nickel. According to a **Pittsburgh** producer, stainless sheet capacity is booked into mid-August, forging billets into June, bars into early July, and extrusions through July. Plates are even tougher —through August.

WAREHOUSES . . . In **Detroit**, business for flat-rolled products and bars has fallen off, indicating that normal mill buyers are able to get most of their requirements from mills. But demand for plate and structurals is strong as ever, with no easing in sight. **Chicago** warehouses are offering some good prices on cold-rolled sheet about 1¢ per lb over mill price, but this is on small lots and isn't general. Most of the warehouses are eager to build up a better balance in cold-rolled sheet inventory, both to take advantage of price increases ahead and also to have better variety.

PIPE AND TUBING . . . There has been no break in the solid demand for oil country goods. **Pittsburgh** producers say capacity for casing, tubing and drill pipe is booked through the end of the year. In **Chicago**, the market is much the same, with no relief in sight. (See P. 56 for details on oil country market.)

**Purchasing Agent's Checklist**

FINANCIAL: How steel companies fared in first quarter . . . . . p. 53

TOOLS AND DIES: Shops are loaded with business . . . . . p. 59

COPPER: New price policies p. 154

# Comparison of Prices

*(Effective May 1, 1956)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | May 1 1956 | Apr. 24 1956 | Apr. 3 1956 | May 3 1955 |
|---|---|---|---|---|
| **Flat-Rolled Steel:** (per pound) | | | | |
| Hot-rolled sheets | 4.325¢ | 4.325¢ | 4.325¢ | 4.05¢ |
| Cold-rolled sheets | 5.325 | 5.325 | 5.325 | 4.95 |
| Galvanized sheets (10 ga.) | 5.85 | 5.85 | 5.85 | 5.45 |
| Hot-rolled strip | 4.325 | 4.325 | 4.325 | 4.05 |
| Cold-rolled strip | 6.28 | 6.28 | 6.29 | 5.79 |
| Plate | 4.52 | 4.52 | 4.52 | 4.225 |
| Plates, wrought iron | 10.40 | 10.40 | 10.40 | 9.80 |
| Stainl's C-R strip (No. 302) | 44.50 | 44.50 | 44.50 | 41.50 |
| **Tin and Terneplate:** (per base box) | | | | |
| Tinplate (1.50 lb.) cokes | $9.85 | $9.45* | $9.45* | $9.05 |
| Tinplate, electro (0.50 lb.) | 8.35 | 8.15* | 8.15* | 7.75 |
| Special coated mfg. ternes | 9.10 | 8.70* | 8.70* | 7.85 |
| **Bars and Shapes:** (per pound) | | | | |
| Merchant bars | 4.65¢ | 4.65¢ | 4.65¢ | 4.30¢ |
| Cold finished bars | 5.90 | 5.90 | 5.90 | 5.40 |
| Alloy bars | 5.65 | 5.65 | 5.65 | 5.075 |
| Structural shapes | 4.60 | 4.60 | 4.60 | 4.25 |
| Stainless bars (No. 302) | 38.25 | 38.25 | 38.25 | 35.50 |
| Wrought iron bars | 11.50 | 11.50 | 11.50 | 10.40 |
| **Wire:** (per pound) | | | | |
| Bright wire | 6.60¢ | 6.60¢* | 6.25¢ | 5.75¢ |
| **Rails:** (per 100 lb.) | | | | |
| Heavy rails | $4.725 | $4.725 | $4.725 | $4.45 |
| Light rails | 5.65 | 5.65 | 5.65 | 5.35 |
| **Semifinish Steel:** (per net ton) | | | | |
| Rerolling billets | $68.50 | $68.50 | $68.50 | $64.00 |
| Slabs, rerolling | 68.50 | 68.50 | 68.50 | 64.00 |
| Forging billets | 84.50 | 84.50 | 84.50 | 78.00 |
| Alloy blooms, billets, slabs | 96.00 | 96.00 | 96.00 | 86.00 |
| **Wire Rod and Skelp:** (per pound) | | | | |
| Wire rods | 5.025¢ | 5.025¢ | 5.025¢ | 4.675¢ |
| Skelp | 4.225 | 4.225 | 4.225 | 3.90 |
| **Finished Steel Composite:** (per pound) | | | | |
| Base price | 5.179¢ | 5.179¢ | 5.179¢ | 4.797¢ |

| | May 1 1956 | Apr. 24 1956 | Apr. 3 1956 | May 3 1955 |
|---|---|---|---|---|
| **Pig Iron:** (per gross ton) | | | | |
| Foundry del'd Phila. | $65.26 | $65.26 | $65.26 | $61.19 |
| Foundry Valley | 60.50 | 60.50 | 60.50 | 56.50 |
| Foundry, Southern Cin'ti | 62.93 | 62.93 | 62.93 | 60.43 |
| Foundry, Birmingham | 55.00 | 55.00 | 55.00 | 52.88 |
| Foundry, Chicago | 60.50 | 60.50 | 60.50 | 56.50 |
| Basic del'd Philadelphia | 64.48 | 64.48 | 64.48 | 60.27 |
| Basic, Valley furnace | 60.00 | 60.00 | 60.00 | 56.00 |
| Malleable, Chicago | 60.50 | 60.50 | 60.50 | 56.50 |
| Malleable, Valley | 60.50 | 60.50 | 60.50 | 56.50 |
| Ferromanganese‡, cents per lb. | 9.50¢ | 9.50¢ | 9.50¢ | 9.50¢ |
| **Pig Iron Composite:** (per gross ton) | | | | |
| Pig iron | $60.29 | $60.29 | $59.71 | $56.59 |
| **Scrap:** (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | *$54.50* | $56.50 | $55.50 | $35.50 |
| No. 1 steel, Phila. area | *56.50* | 55.50 | 53.00 | 36.00 |
| No. 1 steel, Chicago | *54.00* | 54.50 | 52.50 | 33.50 |
| No. 1 bundles, Detroit | *51.50* | 53.50 | 52.50 | 27.50 |
| Low phos., Youngstown | *61.50* | 62.50 | 59.50 | 35.50 |
| No. 1 mach'y cast, Pittsburgh | 58.50 | 58.50 | 58.50 | 43.50 |
| No. 1 mach'y cast, Philadel'a | 55.50 | 55.50 | 55.50 | 44.50 |
| No. 1 mach'y cast, Chicago | *56.50* | 57.50 | 56.50 | 46.50 |
| **Steel Scrap Composite:** (per gross ton) | | | | |
| No. 1 heavy melting scrap | *$55.00* | $55.50 | $53.67 | $35.00 |
| **Coke, Connellsville:** (per net ton at oven) | | | | |
| Furnace coke, prompt | $14.50 | $14.50 | $14.25 | $13.00 |
| Foundry coke, prompt | 17.50 | 17.50 | 16.25 | 16.75 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | $46.00 | $46.00 | $46.00 | $36.00 |
| Copper, Lake, Conn. | 46.00 | 46.00 | 46.00 | 36.00 |
| Tin, Straits, New York | 98.375† | 98.75 | 100.375 | 91.125 |
| Zinc, East St. Louis | 13.50 | 13.50 | 13.50 | 12.00 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 14.80 |
| Aluminum, virgin ingot | 25.90 | 25.90 | 25.90 | 23.20 |
| Nickel, electrolytic | 64.50 | 64.50 | 64.50 | 67.67 |
| Magnesium, ingot | 34.50 | 34.50 | 33.25 | 29.25 |
| Antimony, Laredo, Tex. | 33.00 | 33.00 | 33.00 | 28.50 |

† Tentative. ‡ Average. *Revised.

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

**Steel Scrap Composite**

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 160→

| Producing Point | Basic | Fdry. | Mall. | Bess. | Low Phos. |
|---|---|---|---|---|---|
| Bethlehem *B3* | 62.00 | 62.50 | 63.00 | 63.50 | ..... |
| Birdsboro, Pa. *B6* | 62.00 | 62.50 | 63.00 | 63.50 | ..... |
| Birmingham *R3* | 54.50 | 55.00* | ..... | ..... | ..... |
| Birmingham *W9* | 54.50 | 55.00* | 59.00 | ..... | ..... |
| Birmingham *U4* | 54.50 | 55.00* | 59.00 | ..... | ..... |
| Buffalo *R3* | 60.00 | 60.50 | 61.00 | 61.50 | ..... |
| Buffalo *H1* | 60.00 | 60.50 | 61.00 | ..... | ..... |
| Buffalo *W6* | 60.00 | 60.50 | 61.00 | 61.50 | ..... |
| Chester *C17* | 62.00 | 62.50 | 63.00 | ..... | ..... |
| Chicago *I4* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| Cleveland *A5* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00† |
| Cleveland *R3* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| Duluth *I4* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00 |
| Erie *I4* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00 |
| Everett *M6* | ..... | 62.50 | 63.00 | ..... | ..... |
| Fontana *K1* | 67.50 | 68.00 | ..... | ..... | ..... |
| Geneva, Utah *C7* | 60.00 | 60.50 | ..... | ..... | ..... |
| Granite City *G2* | 61.90 | 62.40 | 62.90 | ..... | ..... |
| Hubbard *Y1* | ..... | ..... | 60.50 | ..... | ..... |
| Lone Star *L3* | ..... | 55.00 | ..... | ..... | ..... |
| Midland *C11* | 60.00 | ..... | ..... | ..... | ..... |
| Minnequa *C6* | 62.00 | 62.50 | 63.00 | ..... | ..... |
| Monessen *P6* | 60.00 | ..... | ..... | ..... | ..... |
| Neville Is. *P4* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00† |
| N. Tonawanda *T1* | ..... | 60.50 | 61.00 | 61.50 | ..... |
| Pittsburgh *U1* | 60.00 | ..... | 60.50 | 61.00 | ..... |
| Sharpsville *S3* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| So. Chicago *R3* | 60.00 | ..... | 60.50 | ..... | ..... |
| Steelton *B3* | 62.00 | 62.50 | 63.00 | 63.50 | 68.00 |
| Swedeland *A2* | 62.00 | 62.50 | 63.00 | 63.50 | ..... |
| Toledo *I4* | 60.00 | 60.50 | 60.56 | 61.00 | ..... |
| Troy, N. Y. *R3* | 62.00 | 62.50 | 63.00 | 63.50 | 68.00 |
| Youngstown *Y1* | ..... | ..... | 60.50 | 61.00 | ..... |

**DIFFERENTIALS:** Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos.

Silvery Iron Buffalo, *H1*, $68.75; Jackson, *J1*, *G1*, $87.50. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

| Product | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, rerolling | 17.75 | 19.00 | — | 20.25 | 31.50 | 25.00 | 33.75 | 15.00 | — | 15.25 |
| Slabs, billets, rerolling | 22.25 | 24.75 | 26.75 | 26.00 | 40.25 | 32.00 | 43.00 | 19.50 | — | 19.75 |
| Forg. discs, die blocks, rings | — | — | — | — | — | — | — | — | — | — |
| Billets, forging | 31.75 | 32.00 | 34.75 | 33.75 | 51.25 | 38.25 | 51.00 | 25.50 | 26.00 | 26.00 |
| Bars, wires, structurals | 38.00 | 38.25 | 41.00 | 40.25 | 60.75 | 45.25 | 60.00 | 30.50 | 31.00 | 31.00 |
| Plates | 40.00 | 40.25 | 42.75 | 43.00 | 64.00 | 49.25 | 64.75 | 31.75 | 32.25 | 32.25 |
| Sheets | 44.25 | 44.50 | 52.25 | 47.25 | 68.25 | 54.25 | 73.50 | 36.25 | — | 36.75 |
| Strip, hot-rolled | 32.00 | 34.50 | — | 37.25 | 58.25 | 44.25 | 59.75 | — | — | — |
| Strip, cold-rolled | 41.00 | 44.50 | — | 47.25 | 68.25 | 54.25 | 73.50 | 36.25 | — | 36.75 |

STAINLESS STEEL PRODUCING POINTS:

*Sheets:* Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*, (2.25¢ lower on Type 430) *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

*Strip:* Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, *O., R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

*Bar:* Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*.

*Wire:* Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

*Structurals:* Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

*Plates:* Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*.

*Forged discs, die blocks, rings:* Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

*Forgings billets:* Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*.

# Scrap Slips From Record High

**Slight easing in major areas brings composite down 50¢ . . . Pittsburgh is off $2.00 for No. 1 steelmaking grades . . . Export controls due for discussion.**

◆ THE MARKET seemed to be falling away from the record heights of the past several weeks. Prices dropped in such major consuming areas as Pittsburgh, Chicago, Cleveland, and the Valley.

The slight easing represented a lot of blood, sweat, and tears for consumers, who have been fighting the higher prices with every weapon in the arsenal. This includes using blast furnaces to the hilt and moving in and out of the market with small purchases to avoid disturbing the status quo.

Some observers feel the market is in for another reaction downward. But the picture was not clear. Philadelphia, for instance, moved up $1 this week, probably due to the competition of export demand.

Meanwhile, there seems to be an intradepartmental fight in Commerce Dept. over the need for stringent controls on scrap exports. The Business and Defense Services Administration is plugging for controls, but Commerce, of which BDSA is a part, seems to feel that now is not the time for further restrictions. Commerce feels scrap prices are not out of line.

Steel leaders, at least some of them, are outspoken on the export question. And if they had their way, exports would be cut to a comparative trickle.

THE IRON AGE Scrap composite dropped 50¢ to $55.00 per ton.

**Pittsburgh . . .** A mill on the fringe of the district bought No. 1 steel this week at a price equivalent to $55, delivered Pittsburgh. This was $1 higher than a large consumer paid last week and $2 below the previous price in the district. Oddly enough, the fringe mill bought secondary openhearth grades at an equivalent price below that paid last week by the large consumer. Blast furnace grades moved up $1 to $2, indicating the emphasis on hot metal. Low phos eased $1.

**Chicago . . .** In an active market, No. 2 heavy melting was pegged at $45 by a new mill sale, No. 1 dealer heavy moved again at $55 despite an offer to buy industrial No. 1 heavy at only $1 higher than that figure, turnings went off slightly on a new order, and cast grades slipped slightly. An offer to buy No. 1 factory bundles at $57 did not affect the market strongly, though a new sale of $59 was confirmed. No. 1 RR continued to hold, as did most railroad grades. With a movement of No. 1 dealer bundles on a $54, the effect was to at least temporarily depress bundles beneath heavy melting.

**Philadelphia . . .** Both steelmaking and cast grades exhibited strength this week. But whereas heavy cast shipments continued at the going price, both No. 1 and No. 2 steel moved up $1 on the basis of an order from a major mill in the area. Dealers insist that shipments are still very heavy, demand holding up well. Although not a major factor, there are several boats currently loading up with export metal, which certainly won't weaken the market.

**New York . . .** High volume of material moving from this district to mills has eased pressure for steelmaking grades. These are off $1 to a top of $50 for No. 1 heavy melting. Turnings and cast are steady with no price changes.

**Detroit . . .** Although no mill buying has been reported in this area, prices on No. 1 grades were off $2 on the basis of bidding on the auto lists. The lists closed $3 to $4 lower than they did last month. Additional unexpected tonnages on the lists were the cause of the softening market.

**Cleveland . . .** Market took a turn for the worst with local automotive lists skidding as much as $4 per ton from the previous month. Most dealers and brokers feel the reaction has set in. Local auto lists are widely split into small tonnages averaging $59 for one major lot and $58 for a second compared to $63 high last month. With large brokers pulling out of the market, dealers buying for $1-$2 less and canceling orders for undelivered materials, comfortable mill inventories and general nervousness, dealer grade quotation dropped $1 on appraisal. The only exception was low phos in the valley, where price continues firm with $63 purchase of production lists and specified yards.

**Birmingham . . .** The Southern scrap market continues quiet with strength being shown only in specialty items. Brokers note a tendency of prices in Northern markets to level off and report shipments from this area to Northern mills appear to be slowing up.

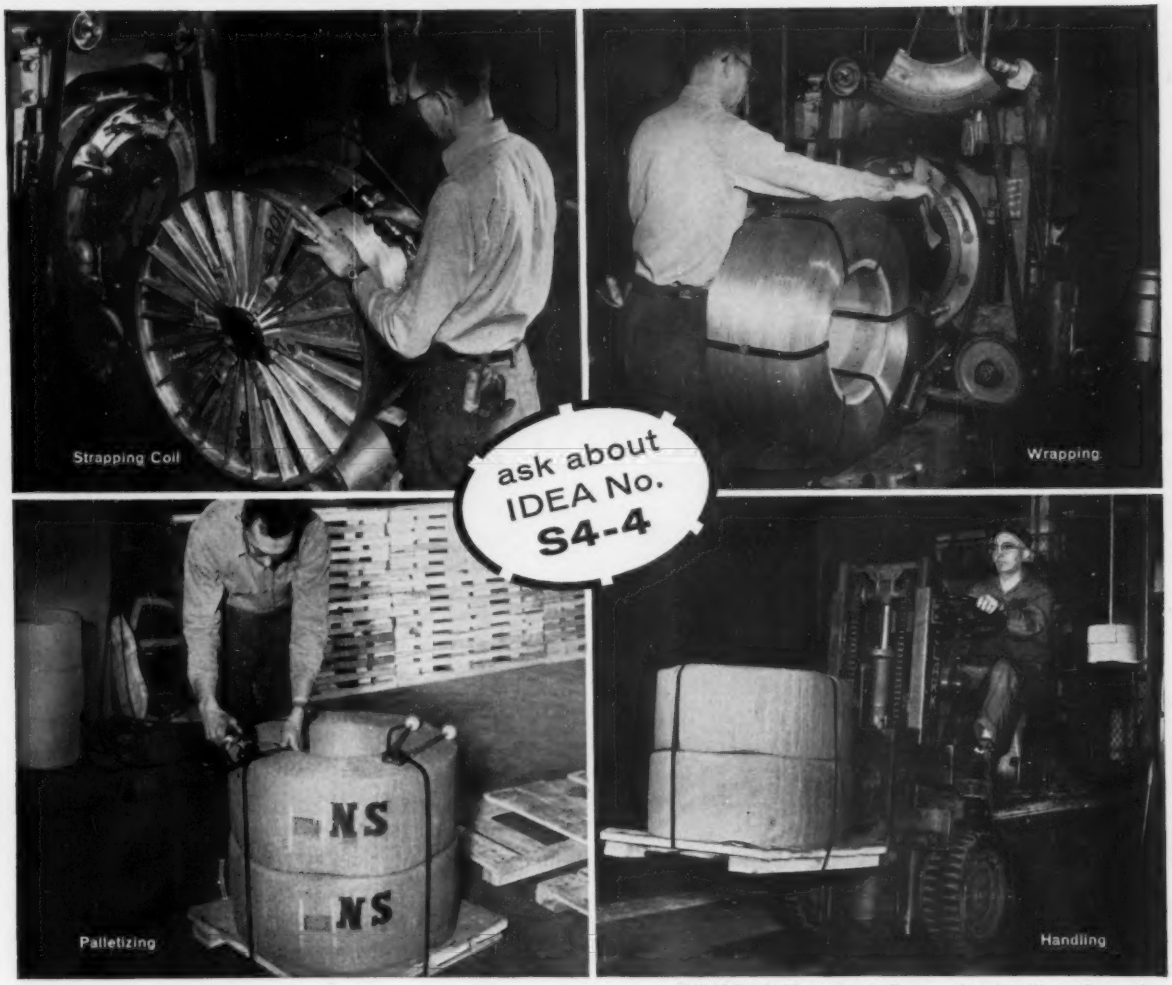
**St. Louis . . .** Recent price advances in scrap brought out a heavy movement of material and consumers have been getting more scrap than they want with more to come. The result has been a softening of the market and while prices are generally unchanged, it is expected that lower prices will prevail.

**Cincinnati . . .** Price was down $1 on primary grades and $2 on secondary upon announcement of monthly prices by major fringe area consumer. The overall market was weaker, reflecting a decline in other areas, including Pittsburgh.

**Buffalo . . .** No new buying has been reported and the market here has been steady. Major purchases are expected next week. Dealers expect a slightly lower price because of weakening Valley prices.

**Boston . . .** For the first time in five weeks the market is easier as big consumers cut down on purchases of better grade scrap, causing a price drop of $1. Some users are buying at these prices and there is still some export activity.

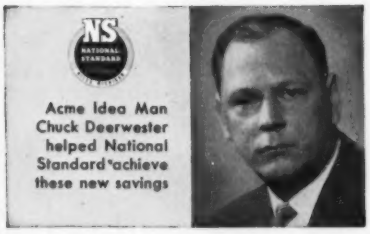
**West Coast . . .** All Los Angeles and San Francisco prices moved up, with Seattle expected to follow. Mills jumped prices as a protection against increasing export business. Biggest jump is in No. 2 heavy melting, a big export item.




National-Standard has patents pending on equipment for this certain operation.

Check your AIM* . . . National-Standard did

## Steel strapping idea cuts two big costs




**NATIONAL-STANDARD COMPANY** of Niles, Michigan, with an important assist from Acme Steel, has cut *shipping* and *handling* costs for its customers in the packaging of tire bead wire.

This wire formerly was shipped on returnable steel reels, for which the customer was charged—then credited when reel was returned. Wire is now wound on a fibre core placed on a collapsible reel. Acme Steel Strapping is applied, reel is dismantled, and coil of wire is ready for wrapping and palletizing. Reel charges are abolished, freight costs to customers are cut, and palletizing with steel strapping is simplifying handling and storage problems.

***Check YOUR Acme Idea Man.** He will work with you—give you Acme Steel Strapping ideas to help you with your packaging and shipping problems. Call him at the nearest Acme Steel offices, or write Acme Steel Company, 2840 Archer Avenue, Dept. EF-56, Chicago 8, Illinois.

**ACME STEEL STRAPPING** ACME STEEL

# Scrap Prices *(Effective May 1, 1956)*

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

### Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $54.00 to $55.00 |
| No. 2 hvy. melting | 44.00 to 45.00 |
| No. 1 bundles | 54.00 to 55.00 |
| No. 2 bundles | 42.00 to 43.00 |
| Machine shop turn. | 38.00 to 39.00 |
| Mixed bor. and ms. turn. | 38.00 to 39.00 |
| Shoveling turnings | 43.00 to 44.00 |
| Cast iron borings | 43.00 to 44.00 |
| Low phos. punch'gs plate | 63.00 to 64.00 |
| Heavy turnings | 52.00 to 53.00 |
| No. 1 RR hvy. melting | 64.00 to 65.00 |
| Scrap rails, random lgth. | 68.00 to 69.00 |
| Rails 2 ft and under | 73.00 to 74.00 |
| RR. steel wheels | 70.00 to 71.00 |
| RR. spring steel | 70.00 to 71.00 |
| RR. couplers and knuckles | 70.00 to 71.00 |
| No. 1 machinery cast | 58.00 to 59.00 |
| Cupola cast | 52.00 to 53.00 |
| Heavy breakable cast | 50.00 to 51.00 |

### Chicago

| | |
|---|---|
| No. 1 hvy. melting | $53.00 to $55.00 |
| No. 2 hvy. melting | 44.00 to 45.00 |
| No. 1 factory bundles | 58.00 to 59.00 |
| No. 1 dealers' Bundles | 53.00 to 54.00 |
| No. 2 dealers' bundles | 39.00 to 40.00 |
| Machine shop turn. | 30.00 to 31.00 |
| Mixed bor. and turn. | 32.00 to 33.00 |
| Shoveling turnings | 32.00 to 33.00 |
| Cast iron borings | 32.00 to 33.00 |
| Low phos. forge crops | 63.00 to 64.00 |
| Low phos. punch'gs plate | 59.00 to 61.00 |
| Low phos. 3 ft and under | 58.00 to 59.00 |
| No. 1 RR. hvy. melting | 58.00 to 60.00 |
| Scrap rails, random lgth | 67.00 to 68.00 |
| Rerolling rails | 74.00 to 75.00 |
| Rails 2 ft and under | 73.00 to 74.00 |
| Locomotive tires, cut | 64.00 to 65.00 |
| Cut bolsters & side frames | 64.00 to 65.00 |
| Angles and splice bars | 70.00 to 71.00 |
| RR. steel car axles | 72.00 to 73.00 |
| RR. couplers and knuckles | 63.00 to 64.00 |
| No. 1 machinery cast | 56.00 to 57.00 |
| Cupola cast | 52.00 to 53.00 |
| Heavy breakable cast | 46.00 to 47.00 |
| Cast iron brake shoes | 44.00 to 45.00 |
| Cast iron car wheels | 56.00 to 57.00 |
| Malleable | 65.00 to 67.00 |
| Stove plate | 46.00 to 47.00 |
| Steel car wheels | 62.00 to 63.00 |

### Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $56.00 to $57.00 |
| No. 2 hvy. melting | 47.00 to 48.00 |
| No. 1 bundles | 56.00 to 57.00 |
| No. 2 bundles | 45.00 to 46.00 |
| Machine shop turn. | 37.00 to 38.00 |
| Mixed bor. short turn. | 38.00 to 39.00 |
| Cast iron borings | 41.00 to 42.00 |
| Shoveling turnings | 41.00 to 42.00 |
| Clean cast chem. borings | 46.50 to 47.50 |
| Low phos. 5 ft and under | 58.00 to 59.00 |
| Low phos. 2 ft and under | 59.00 to 60.00 |
| Low phos. punch'gs | 59.00 to 60.00 |
| Elec. furnace bundles | 56.00 to 57.00 |
| Heavy turnings | 51.00 to 52.00 |
| RR. steel wheels | 62.00 to 63.00 |
| RR. spring steel | 62.00 to 63.00 |
| Rails 18 in. and under | 67.00 to 68.00 |
| Cupola cast | 50.00 to 52.00 |
| Heavy breakable cast | 53.00 to 54.00 |
| Cast iron car wheels | 58.50 to 59.50 |
| Malleable | 69.00 to 70.00 |
| Unstripped motor blocks | 38.00 to 39.00 |
| No. 1 machinery cast | 55.00 to 56.00 |

### Cleveland

| | |
|---|---|
| No. 1 hvy. melting | $56.00 to $57.00 |
| No. 2 hvy. melting | 48.00 to 49.00 |
| No. 1 bundles | 56.00 to 57.00 |
| No. 2 bundles | 41.00 to 42.00 |
| No. 1 busheling | 56.00 to 57.00 |
| Machine shop turn. | 32.00 to 33.00 |
| Mixed bor. and turn. | 36.00 to 37.00 |
| Shoveling turnings | 36.00 to 37.00 |
| Cast iron borings | 36.00 to 37.00 |
| Cut struct'r'l & plates, 2 ft & under | 60.00 to 61.00 |
| Drop forge flashings | 56.00 to 57.00 |
| Low phos. punch'gs, plate | 57.00 to 58.00 |
| Foundry steel, 2 ft & under | 58.00 to 59.00 |
| No. 1 RR. heavy melting | 60.00 to 61.00 |
| Rails 2 ft and under | 73.00 to 74.00 |
| Rails 18 in. and under | 74.00 to 75.00 |
| Railroad grate bars | 43.00 to 44.00 |
| Steel axle turnings | 40.00 to 41.00 |
| Railroad cast | 58.00 to 59.00 |
| No. 1 machinery cast | 57.00 to 58.00 |
| Stove plate | 53.00 to 54.00 |
| Malleable | 61.00 to 62.00 |

### Youngstown

| | |
|---|---|
| No. 1 hvy. melting | $58.00 to $59.00 |
| No. 2 hvy. melting | 44.00 to 45.00 |
| No. 1 bundles | 58.00 to 59.00 |
| No. 2 bundles | 41.00 to 42.00 |
| Machine shop turn. | 32.00 to 33.00 |
| Shoveling turnings | 37.00 to 38.00 |
| Cast iron borings | 37.00 to 38.00 |
| Low phos. plate | 61.00 to 62.00 |

### Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $54.00 to $55.00 |
| No. 2 hvy. melting | 42.00 to 43.00 |
| No. 1 busheling | 54.00 to 55.00 |
| No. 1 bundles | 54.00 to 55.00 |
| No. 2 bundles | 38.00 to 39.00 |
| Machine shop turn. | 29.00 to 30.00 |
| Mixed bor. and turn. | 30.00 to 31.00 |
| Shoveling turnings | 31.00 to 32.00 |
| Cast iron borings | 31.00 to 32.00 |
| Low phos. plate | 57.00 to 58.00 |
| Scrap rails, random lgth. | 60.00 to 61.00 |
| Rails 2 ft and under | 70.00 to 71.00 |
| RR. steel wheels | 60.00 to 61.00 |
| RR. spring steel | 60.00 to 61.00 |
| RR. couplers and knuckles | 60.00 to 61.00 |
| No. 1 machinery cast | 53.00 to 54.00 |
| No. 1 cupola cast | 50.00 to 51.00 |

### Detroit

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $51.00 to $52.00 |
| No. 2 hvy. melting | 46.00 to 47.00 |
| No. 1 bundles, openhearth | 51.00 to 52.00 |
| No. 2 bundles | 38.00 to 39.00 |
| New busheling | 51.00 to 52.00 |
| Drop forge flashings | 50.50 to 51.50 |
| Machine shop turn. | 24.00 to 25.00 |
| Mixed bor. and turn. | 27.00 to 28.00 |
| Shoveling turnings | 27.00 to 28.00 |
| Cast iron borings | 27.00 to 28.00 |
| Low phos. punch'gs, plate | 51.00 to 52.00 |
| No. 1 cupola cast | 46.00 to 47.00 |
| Heavy breakable cast | 39.00 to 40.00 |
| Stove plate | 40.00 to 41.00 |
| Automotive cast | 50.00 to 51.00 |

### St. Louis

| | |
|---|---|
| No. 1 hvy. melting | $45.00 to $46.00 |
| No. 2 hvy. melting | 42.50 to 43.50 |
| No. 1 bundles | 48.00 to 49.00 |
| No. 2 bundles | 38.50 to 39.50 |
| Machine shop turn. | 29.50 to 30.50 |
| Cast iron borings | 31.50 to 32.50 |
| Shoveling turnings | 31.50 to 32.50 |
| No. 1 RR. hvy. melting | 57.00 to 58.00 |
| Rails, random lengths | 60.00 to 61.00 |
| Rails 18 in. and under | 67.00 to 68.00 |
| Locomotive tires uncut | 57.00 to 58.00 |
| Angles and splice bars | 58.00 to 59.00 |
| Std. steel car axles | 55.00 to 56.00 |
| RR. specialties | 58.00 to 59.00 |
| Cupola cast | 51.00 to 52.00 |
| Heavy breakable cast | 43.00 to 44.00 |
| Cast iron brake shoes | 42.00 to 43.00 |
| Stove plate | 42.00 to 43.00 |
| Cast iron car wheels | 57.00 to 58.00 |
| Rerolling rails | 73.00 to 74.00 |
| Malleable | 50.00 to 51.00 |
| Unstripped motor blocks | 43.00 to 44.00 |

### Boston

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $46.00 to $47.00 |
| No. 2 hvy. melting | 36.00 to 36.50 |
| No. 1 bundles | 46.00 to 47.00 |
| No. 2 bundles | 34.50 to 35.00 |
| No. 1 busheling | 46.00 to 47.00 |
| Elec. furnace, 3 ft & under | 47.50 to 48.50 |
| Machine shop turn. | 28.00 to 28.50 |
| Mixed bor. and short turn. | 28.00 to 29.00 |
| Shoveling turnings | 31.00 to 31.50 |
| Clean cast chem. borings | 32.00 to 33.00 |
| No. 1 machinery cast | 45.50 to 46.00 |
| Mixed cupola cast | 41.00 to 42.00 |
| Heavy breakable cast | 42.50 to 43.00 |
| Stove plate | 39.00 to 40.00 |
| Unstripped motor blocks | 27.50 to 28.00 |

### New York

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $49.00 to $50.00 |
| No. 2 hvy. melting | 41.00 to 42.00 |
| No. 2 bundles | 39.00 to 40.00 |
| Machine shop turn. | 27.00 to 28.00 |
| Mixed bor. and turn. | 27.00 to 28.00 |
| Shoveling turnings | 31.00 to 32.00 |
| Clean cast chem. borings | 32.00 to 33.00 |
| No. 1 machinery cast | 49.00 to 50.00 |
| Mixed yard cast | 46.00 to 47.00 |
| Charging box cast | 46.00 to 47.00 |
| Heavy breakable cast | 46.00 to 47.00 |
| Unstripped motor blocks | 33.00 to 34.00 |

### Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $39.00 to $40.00 |
| No. 2 hvy. melting | 37.00 to 38.00 |
| No. 1 bundles | 39.00 to 40.00 |
| No. 2 bundles | 32.00 to 33.00 |
| No. 1 busheling | 39.00 to 40.00 |
| Machine shop turn. | 31.00 to 32.00 |
| Shoveling turnings | 32.00 to 33.00 |
| Cast iron borings | 21.50 to 22.50 |
| Electric furnace bundles | 44.00 to 45.00 |
| Bar crops and plates | 52.00 to 53.00 |
| Structural and plate, 2 ft | 51.00 to 52.00 |
| No. 1 RR. hvy. melting | 50.00 to 51.00 |
| Scrap rails, random lgth. | 60.00 to 61.00 |
| Rails, 18 in. and under | 63.00 to 64.00 |
| Angles & splice bars | 59.00 to 60.00 |
| Rerolling rails | 65.00 to 66.00 |
| No. 1 cupola cast | 45.00 to 46.00 |
| Stove plate | 46.00 to 47.00 |
| Charging box cast | 32.00 to 33.00 |
| Cast iron car wheels | 39.00 to 40.00 |
| Unstripped motor blocks | 37.00 to 38.00 |
| Mashed tin cans | 15.00 to 16.00 |

### Cincinnati

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $52.00 to $53.00 |
| No. 2 hvy. melting | 41.00 to 42.00 |
| No. 1 bundles | 52.00 to 53.00 |
| No. 2 bundles | 38.00 to 39.00 |
| Machine shop turn. | 31.00 to 32.00 |
| Mixed bor. and turn. | 31.50 to 32.50 |
| Shoveling turnings | 34.50 to 35.50 |
| Cast iron borings | 31.50 to 32.50 |
| Low phos. 18 in. & under | 58.00 to 59.00 |
| Rails, random lengths | 62.00 to 63.00 |
| Rails, 18 in. and under | 70.00 to 71.00 |
| No. 1 cupola cast | 49.00 to 50.00 |
| Hvy. breakable cast | 47.00 to 48.00 |
| Drop broken cast | 58.00 to 59.00 |

### San Francisco

| | |
|---|---|
| No. 1 hvy. melting | $40.00 |
| No. 2 hvy. melting | 37.00 |
| No. 1 bundles | 39.00 |
| No. 2 bundles | 32.00 |
| No. 3 bundles | 26.00 |
| Machine shop turn. | 21.00 |
| Cast iron borings | 22.00 |
| No. 1 RR. hvy. melting | 40.00 |
| No. 1 cupola cast | 48.00 |

### Los Angeles

| | |
|---|---|
| No. 1 hvy. melting | $41.00 |
| No. 2 hvy. melting | 37.00 |
| No. 1 buntiles | 40.00 |
| No. 2 bundles | 30.00 |
| No. 3 bundles | 26.00 |
| Machine shop turn. | 21.00 |
| Shoveling turnings | 24.00 |
| Cast iron borings | 21.00 |
| Elec. furn. 1 ft and under | 41.00 |
| No. 1 RR. hvy. melting | 41.00 |
| No. 1 cupola cast | 46.00 |

### Seattle

| | |
|---|---|
| No. 1 hvy. melting | $38.00 |
| No. 2 hvy. melting | 35.00 |
| No. 2 bundles | 26.00 |
| No. 3 bundles | 20.00 |
| No. 1 cupola cast | 45.00 |
| Mixed yard cast | 45.00 |

### Hamilton, Ont.

| | |
|---|---|
| No. 1 hvy. melting | $50.50 |
| No. 2 hvy. melting | 46.50 |
| No. 1 bundles | 50.50 |
| No. 2 bundles | 42.00 |
| Mixed steel scrap | 44.50 |
| Bushelings | 40.50 |
| Bush., new fact., prep'd | 48.50 |
| Bush., new fact., unprep'd | 44.50 |
| Machine shop turn. | 23.00 |
| Short steel turn. | 27.50 |
| Mixed bor. and turn. | 24.00 |
| Rails, rerolling | 58.50 |
| Cast scrap | 50.00 |

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# Anaconda "One World" Price

**New Anaconda policy puts floor under Chilean copper sold in U. S. . . . Can't drop below 46¢ lb . . . Weakness in London prompts a "one world" price.**

◆ IT MAY NOT hold for too long, but Anaconda Sales Co. has established the long sought "one world" copper price.

Under a new company policy when the weekly average copper price on the London Metals Exchange drops below 46¢, present domestic price, then the price of Chilean copper sold in U. S. is automatically boosted to the domestic level.

Because of an oversupply, the London price has been dropping. Average for last week was well below 46¢. And it looks like the average for this week will continue to be below this norm.

Custom smelters, who traditionally set the price of their copper slightly over the LME price, have dropped down to 46¢ per lb.

This means that with the exception of copper from Braden, Kennecott subsidiary in Chile, all copper sold in the U. S. last week cost consumers 46¢ per lb.

Kennecott is expected to go along with the new policy so that it is likely that this week it will be unanimous. Copper will cost 46¢ per lb, with no major exceptions.

One reason not to get too enthused about this favorable price shift is the fact that the LME is taking steps to strengthen its price. According to the American Bureau of Metal Statistics, imports of copper in the last reported month, February, were up 17,000 tons over the previous month, to a total of 47,477 tons. Of this, 18,183 was refined copper. Increase here was 4700 tons, most of which came from United Kingdom and Northern Rhodesia, which usually sends most of its copper to U. K. LME is therefore reducing its stock of prompt copper to bring the price back up. However, in doing so it is boosting copper supply of the U. S.

On this basis, the future looks as bright as it has been for several years for copper consumers.

## Daily Nonferrous Metal Prices

*(Cents per lb except as noted)*

| | Apr. 25 | Apr. 26 | Apr. 27 | Apr. 28 | Apr. 30 | May 1 |
|---|---|---|---|---|---|---|
| Copper, electro, Conn. | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 |
| Copper, Lake, delivered | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 |
| Tin, Straits, New York | 98.75 | 98.875 | 99.00 | .... | 98.375 | 98.375 |
| Zinc, East St. Louis | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 15.80 | 15.80 | 15.80 |

*Note: Quotations are going prices.* **Tentative*

## Monthly Average Metal Prices

*(Cents per lb except as noted)*

Average prices of the major nonferrous metals in April based on quotations appearing in THE IRON AGE, were as follows:

| | | | |
|---|---|---|---|
| Electrolytic copper | | Straits tin, New York | 99.268 |
| Del'd Conn. Valley | 46.00 | Zinc, E. St. Louis | 13.50 |
| Lake copper, delivered | 46.00 | Lead, St. Louis | 15.80 |

*Note: Quotations are going prices.*

**ALUMINUM** . . . Not only will there be more aluminum available to fabricators during 1956, but it will be more equitably distributed. This is the main point of the supplementary report on the aluminum situation by a House Small Business Sub-committee.

Actually the aluminum producers have boosted operations in 1956 by rate of about 940,000 tons per year, and defense requirements are expected to drop off. So it is no particular problem to spread the additional available metal enough to satisfy the congressional group.

Aluminum Co. of America, Netherlands Aluminum Co., and the government of the Netherlands territory of Surinam have begun negotiations for construction of a primary aluminum smelter to be constructed in Surinam. Project would include construction of a hydro-electric plant to supply power. Considering the cost of labor and the fact that Surinam is an excellent source for bauxite, such an operation could be very economical.

**TIN** . . . Prospects of a strike strengthen the tin price in both U.S. and London markets. Word from Penang, Malaya indicates that about 1200 dock workers have given notice that if negotiations of their wage demands are not resumed within 14 days they will stop work. Port commissioner insists that service will be maintained. But the London and U.S. buyers seem to place more stock in union. Chances are negotiations will settle down. However, if it gets close to strike deadline and nothing is done, buyers will probably bid price up over $1.00 per lb.

Long range outlook for Malayan tin industry is considered good by the government's acting chief inspector of mines Ian L. Patterson. According to Mr. Patterson, large areas containing low grade ore can now be mined profitably because of the increasingly efficient methods now being introduced. The Malayan official also reports that two-thirds of the federation area is as yet undeveloped. New roads, now in the planning stages, will insure adequate mine output.

**NICKEL** . . . Dissatisfaction of some members of Congress over the results of the initial nickel probe into the government's nickel plant in Nicaro, Cuba, may prompt a subsequent investigation into the nickel situation by a House Small Business Committee. Goal would be to establish status of nickel now available with regard to defense as opposed to civilian requirements.

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# Nonferrous Prices *(Effective May 1, 1956)*

## MILL PRODUCTS

*(Cents per lb, unless otherwise noted)*

### ALUMINUM

*(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)*

**Flat Sheet (Mill Finish) and Plate**

*("F" temper except 6061-0)*

| Alloy | .032 | .081 | .136–.249 | .250–3. |
|---|---|---|---|---|
| 1100, 3003 | 42.3 | 40.2 | 39.0 | 38.0 |
| 5052 | 49.8 | 44.9 | 43.2 | 41.4 |
| 6061-0 | 46.9 | 42.7 | 40.9 | 40.8 |

**Extruded Solid Shapes**

| Factor | 6063 T-5 | 6062 T-6 |
|---|---|---|
| 6–8 | 43.1–44.8 | 58.1–61.7 |
| 12–14 | 43.8–45.2 | 59.0–63.3 |
| 24–26 | 46.8–47.2 | 69.2–73.6 |
| 36–38 | 55.1–55.7 | 92.0–95.8 |

**Screw Machine Stock—2011-T-3**

| Size* | ¼ | ⅜–⅝ | ¾–1 | 1¼–1½ |
|---|---|---|---|---|
| Price | 56.0 | 54.9 | 53.6 | 51.6 |

**Roofing Sheet, Corrugated**

(Per sheet, 26" wide base, 16,000 lb)

| Length* → | 72 | 96 | 120 | 144 |
|---|---|---|---|---|
| .019 gage | $1.310 | $1.742 | $2.175 | $2.605 |
| .024 gage | 1.630 | 2.177 | 2.707 | 3.247 |

### MAGNESIUM

*(f.o.b. shipping pt., carload frt. allowed)*

**Sheet and Plate**

| Type → Gage→ | .250–3.00 | .250–2.00 | .188 | .081 | .032 |
|---|---|---|---|---|---|
| FS1 Stand. Grade | ..... | 65.6 | 66.5 | 75 | 100 |
| FS1 Spec. | ..... | 88.9 | 91.1 | 103.5 | 163.1 |
| Tread Plate | ..... | 67.8 | 68.9 | ..... | ..... |
| Tooling Plate | 70.2 | ..... | ..... | ..... | ..... |

**Extruded Shapes**

| factor → | 6–8 | 12–14 | 24–26 | 36–38 |
|---|---|---|---|---|
| Comm. Grade (FS) | 66.4–69.0 | 67.5–69.6 | 72.1–72.7 | 84.9–85.8 |
| Spec. Grade (AZ31B) | 81.4–84.0 | 82.5–84.6 | 87.1–87.7 | 99.9–100.8 |

**Alloy Ingot**

AZ91B (Die Casting) ..... 35 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 39.25 (Velasco, Tex.)

### NICKEL, MONEL, INCONEL

*(Base prices, f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 102 | 83 | 99 |
| Strip, CR | 102 | 92 | 125 |
| Rod, Bar, HR | 87 | 74 | 93 |
| Angles, HR | 87 | 74 | 93 |
| Plate, HR | 97 | 87 | 95 |
| Seamless tube | 122 | 110 | 153 |
| Shot, Blocks | ... | 71 | ... |

### COPPER, BRASS, BRONZE

*(Freight included on 500 lbs)*

| | Sheet | Wire | Rod | Tube |
|---|---|---|---|---|
| Copper | 68.63 | ..... | ..... | 68.82 |
| Brass, 70/30 | 56.60 | 57.14 | ..... | 59.51 |
| Brass, Low | 61.35 | 61.89 | 61.29 | 64.16 |
| Brass, R L | 63.07 | 63.61 | 63.01 | 65.88 |
| Brass, Naval | 59.80 | 65.06 | 54.11 | 62.96 |
| Munts Metal | 57.84 | 51.85 | 53.65 | ..... |
| Comm. Bz. | 65.33 | 65.87 | 65.27 | 67.89 |
| Mang. Bz. | 63.54 | 66.19 | 57.64 | ..... |
| Phos. Bz. 5% | 86.79 | 84.44 | 87.29 | ..... |

### TITANIUM

(10,000 *lb base, f.o.b. mill*)

Sheet and strip, commercially pure, $13.10-$13.60; alloy $15.25-$15.75; Plate, HR, commercially pure, $10.50-$11.00; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.50-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.90-$8.15; alloy, $7.90-$8.10.

## PRIMARY METAL

*(Cents per lb, unless otherwise noted)*

Aluminum ingot, 99+%, 10,000 lb. freight allowed ..... 25.90
Aluminum pig ..... 24.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be $43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be ..... $74.75
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Cobalt, 97-99% (per lb) ....$2.60 to $2.67
Copper, electro, Conn. Valley ..... 46.00
Copper, Lake, delivered ..... 46.00
Gold, U. S. Treas., per troy oz. ..... $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. ..$100 to $120
Lead, St. Louis ..... 15.80
Lead, New York ..... 16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig ..... 33.75
ingot ..... 34.50
Magnesium, sticks, 100 to 500 lb. .. 56.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$268 to $270
Nickel electro ..... 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel ..... 60.75
Palladium, dollars per troy oz. .$23 to $24
Platinum, dollars per troy oz. .$97 to $107
Silver, New York, cents per troy oz. 90.75
Tin, New York .....98.375*
Titanium sponge, grade A-1 .....$ 3.45
Zinc, East St. Louis ..... 13.50
Zinc, New York ..... 14.00
Zirconium sponge .....$10.00
*Tentative

## REMELTED METALS

### Brass Ingot

*(Cents per lb delivered, carloads)*

85-5-5-5 ingot
No. 115 ..... 40.50
No. 120 ..... 39.50
No. 123 ..... 38.50
80-10-10 ingot
No. 305 ..... 43.75
No. 315 ..... 42.00
88-10-2 ingot
No. 210 ..... 55.75
No. 215 ..... 52.00
No. 245 ..... 46.75
Yellow ingot
No. 405 ..... 31.75
Manganese bronze
No. 421 ..... 36.25

### Aluminum Ingot

*(Cents per lb del'd 30,000 lb and over)*

95-5 aluminum-silicon alloys
0.30 copper max. .....29.75-30.50
0.60 copper max. .....29.50-30.25
Piston alloys (No. 122 type) . 31.00-31.50
No. 12 alum. (No. 2 grade) ....27.75-28.50
108 alloy .....27.75-28.25
195 alloy .....29.75-31.00
13 alloy (0.60 copper max.) ...29.50-30.25
AXS-679 .....27.75-28.25

**Steel deoxidizing aluminum, notch bar granulated or shot**

Grade 1—95-97½% .....27.75-29.00
Grade 2—92-95% .....27.25-28.25
Grade 3—90-92% .....26.50-27.50
Grade 4—85-90% .....25.50-26.75

## SCRAP METALS

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 43⅛ | 42¾ |
| Yellow brass | 32⅛ | 29⅞ |
| Red brass | 38⅛ | 37½ |
| Comm. bronze | 39⅛ | 39½ |
| Mang. bronze | 37⅞ | 29½ |
| Yellow brass rod ends | 32 | .... |

### Custom Smelters Scrap

*(Cents per pound carload lots, delivered to refinery)*

No. 1 copper wire ..... 36½—37
No. 2 copper wire ..... 35 —35½
Light copper ..... 32½—33
*Refinery brass ..... 33½
* Dry copper content.

### Ingot Makers Scrap

*(Cents per pound carload lots, delivered to refinery)*

No. 1 copper wire ..... 36½—37
No. 2 copper wire ..... 35 —35½
Light copper ..... 32½—33
No. 1 composition ..... 32
No. 1 comp. turnings ..... 31
Hvy. yellow brass solids .... 22
Brass pipe ..... 23
Radiators ..... 23
*Aluminum*
Mixed old cast. ..... 18½—19½
Mixed new clips ..... 19½—20½
Mixed turnings, dry ..... 18½—19½

### Dealers' Scrap

*(Dealers' buying price, f.o.b. New York in cents per pound)*

**Copper and Brass**

No. 1 heavy copper and wire 35 —36
No. 2 heavy copper and wire 33½—34
Light copper ..... 31 —31½
New type shell cuttings .... 31½—32
Auto radiators (unsweated) .. 21 —21½
No. 1 composition ..... 27½—28
No. 1 composition turnings .. 26½—27
Unlined red car boxes ..... 21 —21½
Cocks and faucets ..... 22 —22½
Clean heavy yellow brass .... 18½—19
Brass pipe ..... 23½—24
New soft brass clippings .... 23½—24
No. 1 brass rod turnings .... 21 —21½

**Aluminum**

Alum. pistons and struts.... 17 —17½
Aluminum crankcases ..... 16¼—16¾
1100 (2S) aluminum clippings 18 —18½
Old sheet and utensils ..... 17¼—17¾
Borings and turnings ..... 10½—11
Industrial castings ..... 16¼
2024 (24S) clippings ..... 17½—18

**Zinc**

New zinc clippings ..... 8½— 9
Old zinc ..... 6 — 6½
Zinc routings ..... 4¼
Old die cast scrap ..... 3½

**Nickel and Monel**

Pure nickel clippings ..... $1.75-$2.00
Clean nickel turnings ..... $1.65-$1.85
Nickel anodes ..... $1.75-$2.00
Nickel rod ends ..... $1.75-$2.00
New Monel clippings ..... 80-90
Clean Monel turnings ..... 65-70
Old sheet Monel ..... 70-80
Nickel silver clippings, mixed. 25
Nickel silver turnings, mixed. 21

**Lead**

Soft scrap lead ..... 12½—13
Battery plates (dry) ..... 7 — 7¼
Batteries, acid free ..... 4½

**Miscellaneous**

Block tin ..... 84 —85
No. 1 pewter ..... 66 —67
Auto babbitt ..... 43½—44½
Mixed common babbitt ..... 15½
Solder joints ..... 20 —20½
Siphon tops ..... 50
Small foundry type ..... 16¼—16½
Monotype ..... 15½—16
Lino. and stereotype ..... 14½—15
Electrotype ..... 13 —13½
Hand picked type shells ..... 10½—11
Lino. and stereo. dross ..... 5¾— 6
Electro. dross ..... 4¾— 5

IRON AGE

# STEEL PRICES

*(Effective May 1, 1956)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BILLETS, BLOOMS, SLABS | | | PILING | SHAPES STRUCTURALS | | | STRIP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide-Flange | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot-rolled | Alloy Cold-rolled |
| EAST | Bethlehem, Pa. | | | $96.00 *B3* | | 4.65 *B3* | 6.80 *B3* | 4.65 *B3* | | | | | | |
| | Buffalo, N. Y. | $68.50 *B3* | $84.50 *R3 B3* | $96.00 *R3, B3* | 5.45 *B3* | 4.65 *B3* | 6.80 *B3* | 4.65 *B3* | 4.325 *R3,B3* | 6.25 *B3* 6.25 *R7,S10* | 6.425 *B3* | 9.10 *B3* | | |
| | Claymont, Del. | | | | | | | | | | | | | 13.45 *C11* |
| | Harrison, N. J. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | | | | | | | | 4.375 *A2* | 6.30 *A2* | 6.425 *A2* | | | |
| | New Bedford, Mass. | | | | | | | | | 6.70 *R6* | | | | |
| | Johnstown, Pa. | $68.50 *B3* | $84.50 *B3* | $96.00 *B3* | | 4.65 *B3* | 6.80 *B3* | | | | | | | |
| | Boston, Mass. | | | | | | | | | 6.80 *T8* | | | | 13.80 *T8* |
| | New Haven, Conn. | | | | | | | | | 6.70 *D1* *A5* | | | | |
| | Phoenixville, Pa. | | | | | 5.15 *P2* | | 5.15 *P2* | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 4.325 *B3* | 6.25 *B3* | 6.425 *B3* | 9.10 *B3* | | |
| | Bridgeport, Wallingford, Conn. | $73.50 *N8* | $89.50 *N8* | | | | | | 4.625 *N8* | 6.70 *W1* | | | 7.50 *N8* | |
| | Pawtucket, R. I. Worcester, Mass. | | | | | | | | | 6.80 *N7* *A5* | | | | *A5* 13.80 *N7* |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 4.50 *L1* | | | | | |
| | Ashland, Ky | | | | | | | | 4.325 *A7* | | | | | |
| | Canton-Massillon, Dover, Ohio | | $86.50 *R3* | $96.00 *R3* | | | | | | | | | | 13.45 *G4* |
| | Chicago, Ill. | $68.50 *U1* | $84.50 *R3, U1,W8* | $96.00 *R3, U1,W8* | 5.45 *U1* | 4.60 *U1, W8* | 6.75 *U1, Y1* | 4.60 *U1* | 4.55 *A1* 4.325 *N4,W8* | 6.35 *A1,T8* | | | 7.20 *W8* | 13.45 *T8* |
| | Cleveland, Ohio | | | | | | | | | 6.25 *A5,J3* | | 9.30 *A5* | | 13.45 *A5* |
| | Detroit, Mich | | | $96.00 *R5* | | | | | 4.425 *G3,M2* | 6.35 *D1,D2, G3 M2,P11* | 6.525 *G3* | 9.20 *D2, G3* | | |
| | Duluth, Minn. | | | | | | | | | | | | | |
| | Gary, Ind Harbor, Indiana | $68.50 *U1* | $84.50 *U1* | $96.00 *U1, Y1* | 5.45 *I3* | 4.60 *U1, I3* | 6.75 *U1, I3* | | 4.325 *I3, U1,Y1* | 6.35 *I3* 6.25 *Y1* | 6.425 *I3 U1,Y1* | 9.30 *Y1* | 7.20 *Y1, U1* | |
| | Sterling, Ill. | | | | | | | | 4.425 *N4* | | | | | |
| | Indianapolis, Ind | | | | | | | | | 6.40 *C5* | | | | |
| | Newport, Ky. | | | | | | | | | | | | 7.20 *N5* | |
| | Middletown, Ohio | | | | | | | | | 6.45 *A7* | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | $68.50 *C10* | $84.50 *C10* | $96.00 *C10* | | | | | 4.325 *S1, R3* | 6.25 *S1, R3,T4* | 6.425 *S1, R3* | 9.10 *S1, R3* | 7.20 *S1* | 13.45 *S1* |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | 68.50 *U1, J3* | $84.50 *J3, U1,C11* | $96.00 *U1, C11* | 5.45 *U1* | 4.60 *U1, J3* | 6.75 *U1, J3* | 4.60 *U1* | 4.325 *P6* | 6.25 *S7,B4* | | | 7.20 *S9* | 13.45 *S9* |
| | Portsmouth, Ohio | | | | | | | | | | | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | | 4.60 *W3* | | | 4.325 *W3* | 6.25 *F3,W3* | 6.425 *W3* | 9.10 *W3* | | |
| | Youngstown, Ohio | | $84.50 *C10* | $96.00 *Y1, C10* | | | 6.75 *Y1* | | 4.325 *U1, Y1* | 6.25 *Y1,C5* | 6.425 *U1, Y1* | 9.30 *Y1* | 7.20 *U1, Y1* | 13.45 *C5* |
| WEST | Fontana, Cal. | 78.00 *K1* | 94.00 *K1* | 117.00 *K1* | | 5.30 *K1* | 7.40 *K1* | 5.45 *K1* | 5.125 *K1* | 8.00 *K1* | 7.575 *K1* | | 8.95 *K1* | |
| | Geneva, Utah | | $84.50 *C7* | | | 4.60 *C7* | 6.75 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | 4.70 *S2* | 6.85 *S2* | | | | 6.675 *S2* | | 7.45 *S2* | |
| | Los Angeles, Torrance, Cal. | | $94.00 *B2* | $116.00 *B2* | | 5.30 *C7, B2* | 7.45 *B2* | | 5.875 *C7, B2* | 8.30 *C1* | | | 8.40 *B2* | |
| | Minnequa, Colo. | | | | | 4.90 *C6* | | | 5.425 *C5* | | | | | |
| | Portland, Ore. | | | | | 5.35 *O2* | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | $94.00 *B2* | | | 5.25 *B2, P9* | 7.40 *B2* | | 5.875 *B2, C7* | | | | | |
| | Seattle, Wash. | | $98.00 *B2* | | | 5.35 *B2* | 7.50 *B2* | | 5.325 *B2* | | | | | |
| SOUTH | Atlanta, Ga. | | | | | | | | 4.525 *A8* | | | | | |
| | Fairfield, Ala. City, Birmingham, Ala. | $68.50 *T2* | $84.50 *T2* | | | 5.10 *C16* 4.60 *R3,T2* | 6.75 *T2* | | 4.325 *R3,T2* 4.825 *C10* | | 6.425 *T2* | | | |
| | Houston, Lone Star, Texas | $74.50 *L3* | $89.50 *S2* | $101.00 *S2* | | 4.70 *S2* | 6.85 *S2* | | | | 6.675 *S2* | | 7.45 *S2* | |

# STEEL PRICES

*(Effective May 1, 1956)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | SHEETS | | | | | | | | | WIRE ROD | TINPLATE† | | BLACK PLATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-rolled 18 ga. & hvyr. | Cold-rolled | Galvanized 10 ga. | Enameling 12 ga. | Long Terne 10 ga. | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | Hot-rolled 19 ga. | | Cokes* 1.25-lb. base box | Electro* 0.25-lb. base box | Holloware Enameling 29 ga. |
| EAST | Bethlehem, Pa. | | | | | | | | | | | | | |
| | Buffalo, N. Y. | 4.325 *B3* | 5.325 *B3* | | | | 6.375 *B3* | 7.875 *B3* | | | 5.375 *W6* | † Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢. | | |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | 4.375 *A2* | 5.375 *A2* | | | | 6.425 *A2* | | | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | | |
| | Johnstown, Pa. | | | | | | | | | | 5.375 *B3* | | | |
| | Fairless, Pa. | 4.375 *U1* | 5.375 *U1* | | | | 6.425 *U1* | 7.925 *U1* | | | | $9.70 *U1* | $8.40 *U1* | |
| | New Haven, Conn. | | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | | |
| | Sparrows Pt., Md. | 4.325 *B3* | 5.325 *B3* | 5.85 *B3* | | | 6.375 *B3* | 7.875 *B3* | 8.60 *B3* | | 5.475 *B3* | $9.70 *B3* | $8.40 *B3* | |
| | Worcester, Mass. | | | | | | | | | | 5.675 *A5* | | | |
| | Trenton, N. J. | | | | | | | | | | | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | | 5.55 *L1* | | | |
| | Ashland, Ky. | 4.325 *A7* | | 5.85 *A7* | 5.90 *A7* | | | | | | | | | |
| | Canton-Massillon, Dover, Ohio | | | 5.85 *R1, R3* | | | | | | | | | | |
| | Chicago, Joliet, Ill. | 4.55 *A1* 4.325 *W8* | | | | | 6.375 *U1* | | | | 5.375 *N4* 5.375 *A5, R3* | | | |
| | Sterling, Ill. | | | | | | | | | | 5.475 *N4* | | | |
| | Cleveland, Ohio | 4.325 *J3, R3* | 5.325 *J3, R3* | | 5.90 *R3* | | 6.375 *J3, R3* | 7.875 *J3, R3* | | | 5.375 *A5* | | | |
| | Detroit, Mich. | 4.425 *G3, M2* | 5.425 *G3* 5.325 *M2* | | | | 6.475 *G3* | 7.975 *G3* | | | | | | |
| | Newport, Ky. | 4.325 *N5* | 5.325 *N5* | 5.85 *N5* | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 4.325 *I3, U1, Y1* | 5.325 *I3, U1, Y1* | 5.85 *U1, I3* | 5.90 *U1, I3* | 6.25 *U1* | 6.375 *Y1, U1, I3* | 7.875 *U1, Y1* | | | 5.375 *Y1* | $9.60 *I3, U1, Y1* | $8.30 *I3, U1, Y1* | 7.05 *U1, Y1* |
| | Granite City, Ill. | 4.525 *G2* | 5.525 *G2* | 6.05 *G2* | 6.10 *G2* | | | | | | | | $8.40 *G2* | 7.15 *G2* |
| | Kokomo, Ind. | | | 5.95 *C9* | | | | | | | 5.475 *C9* | | | |
| | Mansfield, Ohio | 4.325 *E2* | 5.325 *E2* | | | 6.25 *E2* | | | | | | | | |
| | Middletown, Ohio | | 5.325 *A7* | 5.85 *A7* | 5.90 *A7* | 6.25 *A7* | | | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | 4.325 *S1, R3, N3* | 5.325 *R3, N3* | 5.85 *R3* 6.85 *N3* | 5.90 *N3* | 6.25 *N3* | 6.375 *S1, R3* | 7.875 *R3* | | | | | $8.30 *R3* | |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | 4.325 *J3, U1 P6* | 5.325 *J3, U1, P6* | 5.85 *U1* | 5.90 *U1, A7* | | 6.375 *J3, U1* | 7.875 *U1* | 8.60 *U1* | | 5.825 *P6* 5.375 *A5* | $9.60 *J3, U1* | $8.30 *J3, U1* | 7.05 *U1* |
| | Portsmouth, Ohio | 4.325 *P7* | 5 325 *P7* | | | | | | | | 5.375 *P7* | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.325 *W3, W5* | 5.325 *W3, W5, F3* | 5.85 *W3, W5* | | 6.25 *W3 W5* | 6.375 *W3* | 7 875 *W3* | | | | $9.60 *W3, W5* | $8.30 *W3, W5* | 7.05 *F3, W5* |
| | Youngstown, Ohio | 4.325 *U1, Y1* | 5.325 *Y1* | | 5.90 *Y1* | | 6.375 *U1. Y1* | 7.875 *Y1* | | | 5.375 *Y1* | | | |
| WEST | Fontana, Cal. | 5.125 *K1* | 6.525 *K1* | | | | 7.175 *K1* | 9.075 *K1* | | | | $10.35 | $9.05 | $8.15 |
| | Geneva, Utah | 4.425 *C7* | | | | | | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | | 5.625 *S2* | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | | 6.175 *B2* | | | |
| | Minnequa, Colo. | | | | | | | | | | 5.625 *C6* | | | |
| | San Francisco, Niles Pittsburg, Cal. | 5.025 *C7* | 6.275 *C7* | 6.60 *C7* | | | | | | | 5.675 *C7* | $10.35 *C7* | $9.05 *C7* | |
| | Seattle, Wash. | | | | | | | | | | | | | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | | | | |
| | Fairfield, Ala. Alabama City, Ala. | 4.325 *R3, T2* | 5.325 *T2* | 5.85 *R3, T2* | | | 6.375 *T2* | | | 5.625 *R3* | 5.025 *R3* 5.375 *T2* | $9.70 *T2* | $8.40 *T2* | |
| | Houston, Tex. | | | | | | | | | | 5.625 *S2* | | | |

# STEEL PRICES

*(Effective May 1, 1956)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Steel | Reinforcing | Cold Finished | Alloy Hot rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfr's. Bright |
| EAST | Bethlehem | | | | 5.575 *B3* | 7.425 *B3* | 6.80 *B3* | | | | | |
| | Buffalo, N. Y. | 4.65 *B3,R3* | 4.65 *B3,R3* | 6.30 *B5* | 5.575 *B3,R3* | 7.425 *B3,B5* | 6.80 *B3* | 4.50 *B3,R3* | | | | 6.60 *W6* |
| | Claymont, Del. | | | | | | | 4.80 *C4* | | 6.30 *C4* | 6.725 *C4* | |
| | Coatesville, Pa. | | | | | | | 4.80 *L4* | | 6.30 *L4* | 6.725 *L4* | |
| | Conshohocken, Pa. | | | | | | | 4.50 *A2* | 5.575 *A2* | | 6.725 *A2* | |
| | Harrisburg, Pa. | | | | | | | 5.10 *P2* | 5.575 *C3* | | | |
| | Hartford, Conn. | | | 6.75 *R3* | | 7.725 *R3* | | | | | | |
| | Johnstown, Pa. | 4.65 *B3* | 4.65 *B3* | | 5.575 *B3* | | 6.80 *B3* | 4.50 *B3* | | 6.30 *B3* | 6.725 *B3* | 6.60 *B3* |
| | Fairless, Pa. | 4.80 *U1* | 4.80 *U1* | | 5.725 *U1* | | | | | | | |
| | Newark, N. J. | | | 6.70 *W10* | | 7.60 *W10* | | | | | | |
| | Camden, N. J. | | | 6.70 *P10* | | | | | | | | |
| | Bridgeport, Putnam, Conn. | 4.80 *N8* | | 6.80 *W10* | 5.725 *N8* | | | 4.750 *N8* | | | | |
| | Sparrows Pt., Md. | | 4.65 *B3* | | | | | 4.50 *B3* | | 6.30 *B3* | 6.725 *B3* | 6.70 *B3* |
| | Palmer, Worcester, Readville, Mass. Milton, Pa. | 4.80 *M7* | 4.80 *M7* | 6.70 *W11* 6.45 *C14* 6.70 *B5* | | 7.725 *A5 B5* | | 4.50 *R3* | | | | 6.90 *A5* 6.90 *W6* |
| | Spring City, Pa. | | | 6.35 *K4* | | 7.60 *K4* | | | | | | |
| MIDDLE WEST | Alton, Ill. | 4.85 *L1* | | | | | | | | | | 6.775 *L1* |
| | Ashland, Newport, Ky. | | | | | | | 4.50 *A7,N5* | | 6.30 *N5* | | |
| | Canton-Massillon, Mansfield, Ohio | 4.75 *R3* | | 6.25 *R2,R3* | 5.575 *R3,T5* | 7.425 *R2,R3, T5* | | 4.50 *E1* | | | | |
| | Chicago, Joliet, Ill. | 4.65 *U1, N4,W8,R3,* 5.15 *P13* | 4.65 *N4,R3,* 5.15 *P13* | 6.25 *B5,W8, W10,A5,L2* | 5.575 *U1,R3, W8* | 7.425 *A5,W8, W10,L2,B5* | | 4.50 *U1,W8, I3,R3* 4.725 *A1* | 5.575 *U1* | 6.30 *U1* | 6.725 *U1* | 6.60 *A5,R3, N4,W7* |
| | Cleveland, Ohio | 4.65 *R3* | 4.65 *R3* | 6.25 *A5,C13* | | 7.425 *A5,C13* | 6.80 *R3* | 4.80 *J3,R3* | 5.575 *J3* | | 6.725 *R3,J3* | 6.60 *A5, C13* |
| | Detroit, Mich. | 4.75 *G3* | 4.75 *G3* | 5.90 *R5* 6.45 *B5* 6.50 *P3* 6.10 *P8* | 5.575 *R5* 5.675 *G3* | 7.425 *R5* 7.625 *B5,P3, P8* | 6.90 *G3* | 4.80 *G3* | | | 6.825 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 6.60 *A5* |
| | Gary, Ind. Harbor, Crawfordsville | 4.65 *I3, U1, Y1* | 4.65 *I3, U1, Y1* | 6.25 *M5,R3* | 5.575 *I3, U1, Y1* | 7.425 *M5, R3* | 6.80 *U1,I3, Y1* | 4.50 *I3, U1, Y1* | 5.575 *I3* | 6.30 *U1,Y1* | 6.725 *U1, I3,Y1* | 6.35 *M4* |
| | Granite City, Ill. | | | | | | | 4.70 *G2* | | | | |
| | Kokomo, Ind. | | | | | | | | | | | 6.70 *C9* |
| | Sterling, Ill. | 4.75 *N4* | 4.75 *N4* | | | | | | | | | 6.70 *N4* |
| | Niles, Warren, Ohio Sharon, Pa. | 4.65 *R3,C10* | | 6.25 *C10* | 5.75 *C10* | 7.425 *C10* | 6.80 *R3* | 4.50 *S1,R3* | | 6.30 *S1* | 6.725 *S1* | |
| | Pittsburgh, Pa. Midland, Pa. | 4.65 *J3, U1, C11* | 4.65 *J3, U1* | 6.25 *A5,C8, C11,J3, W10,B4,R3* | 5.575 *U1,C11* | 7.425 *A5,C11, W10,C8,R3* | 6.80 *J3, U1* | 4.50 *J3, U1* | 5.575 *U1* | 6.30 *U1* | 6.725 *J3, U1* | 6.60 *A5,J3, P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 6.60 *P7* |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.65 *W3* | | | | | | 4.50 *W3,W5* | | | | |
| | Youngstown, Ohio | 4.65 *U1,Y1, C10,R3* | 4.65 *U1,Y1, R3* | 6.25 *Y1, U1* | 5.575 *U1,Y1, C10* | 7.425 *Y1,C10, F2* | 6.80 *U1,Y1* | 4.50 *U1,Y1, R3* | | 6.30 *Y1* | 6.725 *Y1* | 6.60 *Y1* |
| WEST | Emeryville, Cal. | 5.40 *J5* | 5.40 *J5* | | | | | | | | | |
| | Fontana, Cal. | 5.35 *K1* | 5.35 *K1* | | 6.625 *K1* | | 7.50 *K1* | 5.20 *K1* | | 7.00 *K1* | 7.375 *K1* | |
| | Geneva, Utah | | | | | | | 4.50 *C7* | | | 6.725 *C7* | |
| | Kansas City, Mo. | 4.90 *S2* | 4.90 *S2* | | 5.825 *S2* | | 7.05 *S2* | | | | | 6.85 *S2* |
| | Los Angeles, Torrance, Cal. | 5.35 *B2,C7* | 5.35 *B2,C7* | 7.70 *R3* | 6.625 *B2* | | 7.50 *B2* | | | | 7.625 *B2* | 7.55 *B2* |
| | Minnequa, Colo. | 5.10 *C6* | 5.10 *C6* | | | | | 5.35 *C6* | | | | 6.85 *C6* |
| | Portland, Ore. | 5.40 *O2* | 5.40 *O2* | | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.35 *C7* 5.40 *B2,P9* | 5.35 *C7* 5.40 *B2,P9* | | | | 7.55 *B2* | | | | | 7.55 *C7* 7.55 *C6* |
| | Seattle, Wash. | 5.40 *B2,P12, N6* | 5.40 *B2,P12* | | | | 7.55 *B2* | 5.40 *B2* | | 7.20 *B2* | 7.625 *B2* | |
| SOUTH | Atlanta, Ga. | 4.85 *A8* | 4.85 *A8* | | | | | | | | | 6.80 *A8* |
| | Fairfield, Ala. City, Birmingham, Ala. | 4.65 *T2,R3* 5.15 *C16* | 4.65 *T2,R3* 5.15 *C16* | | | | 6.80 *T2* | 4.50 *T2,R3* | | | 6.725 *T2* | 6.60 *R3, T2* |
| | Houston, Ft. Worth, Lone Star, Tex. | 4.90 *S2* | 4.90 *S2* | | 5.825 *S2* | | 7.05 *S2* | 4.85 *L3* 4.60 *S2* | | 6.40 *S2* | 6.825 *S2* | 6.85 *S2* |

# Steel Prices *(Effective May 1, 1956)*

## Key to Steel Producers

With Principal Offices

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angell Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, O.
*A8* Atlantic Steel Co., Atlanta, Ga.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Pacific Coast Steel Corp., San Francisco
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.
*B6* Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C3* Central Iron & Steel Co., Harrisburg, Pa.
*C4* Claymont Products Dept., Claymont, Del.
*C5* Cold Metal Products Co., Youngstown, O.
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Pittsburgh, Pa.
*C11* Crucible Steel Co. of America, Pittsburgh
*C12* Cumberland Steel Co., Cumberland, Md.
*C13* Cuyahoga Steel & Wire Co., Cleveland
*C14* Compressed Steel Shafting Co., Readville, Mass.
*C15* G. O. Carlson, Inc., Thorndale, Pa.
*C16* Connors Steel Div., Birmingham
*C17* Chester Blast Furnace, Inc., Chester, Pa.

*D1* Detroit Steel Corp., Detroit
*D2* Detroit Tube & Steel Div., Detroit
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.
*D5* Henry Disston & Sons, Inc., Philadelphia

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire Steel Co., Mansfield, O.

*F1* Firth Sterling, Inc., McKeesport, Pa.
*F2* Fitzsimmons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G1* Globe Iron Co., Jackson, O.
*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit
*G4* Greer Steel Co., Dover, O.

*H1* Hanna Furnace Corp., Detroit

*I2* Ingersoll Steel Div., Chicago
*I3* Inland Steel Co., Chicago
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Joslyn Mfg. & Supply Co., Chicago
*J5* Judson Steel Corp., Emeryville, Calif.

*K1* Kaiser Steel Corp., Fontana, Cal.
*K2* Keystone Steel & Wire Co., Peoria
*K3* Koppers Co., Granite City, Ill.
*K4* Keystone Drawn Steel Co., Spring City, Pa.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O.
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid-States Steel & Wire Co., Crawfordsville, Ind
*M5* Monarch Steel Div., Hammond, Ind.
*M6* Mystic Iron Works, Everett, Mass.
*M7* Milton Steel Products Div., Milton, Pa.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Div., Pittsburgh
*N3* Niles Rolling Mill Div., Niles, O.
*N4* Northwestern Steel & Wire Co., Sterling, Ill.
*N5* Newport Steel Corp., Newport, Ky.
*N6* Northwest Steel Rolling Mills, Seattle
*N7* Newman Crosby Steel Co., Pawtucket, R. I.
*N8* Northeastern Steel Corp., Bridgeport, Conn.

*O1* Oliver Iron & Steel Co., Pittsburgh
*O2* Oregon Steel Mills, Portland

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Iron & Steel Co., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P5* Pittsburgh Screw & Bolt Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.
*P11* Production Steel Strip Corp., Detroit
*P12* Pacific Steel Rolling Mills, Seattle
*P13* Phoenix Mfg. Co., Joliet, Ill.

*R1* Reeves Steel & Mfg. Co., Dover, O.
*R2* Reliance Div., Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co., John A., Trenton, N. J.
*R5* Rotary Electric Steel Co., Detroit
*R6* Rodney Metals, Inc., New Bedford, Mass.
*R7* Rome Strip Steel Co., Rome, N. Y.

*S1* Sharon Steel Corp., Sharon, Pa.
*S2* Sheffield Steel Corp., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw and Steel Co., Fitchburg, Mass.
*S5* Sweet's Steel Co., Williamsport, Pa.
*S6* Standard Forging Corp., Chicago
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Corp., Carnegie, Pa.
*S10* Seneca Steel Service, Buffalo

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T6* Tremont Nail Co., Wareham, Mass.
*T7* Texas Steel Co., Fort Worth
*T8* Thompson Wire Co., Boston

*U1* United States Steel Corp., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.
*U3* Ulbrich Stainless Steels, Wallingford, Conn.
*U4* U. S. Pipe & Foundry Co., Birmingham

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago
*W8* Wisconsin Steel Co., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wyckoff Steel Co., Pittsburgh
*W11* Worcester Pressed Steel Co., Worcester, Mass.
*W12* Wallace Barnes Steel Div., Bristol, Conn.

*Y1* Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE AND TUBING

**Base discounts (pct) f.o.b. mills. Base price about $200 per net ton**

| | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½-3 In. | | 2 In. | | 2½ In. | | 3 In. | | 3½-4 In. | |
| STANDARD T. & C. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| Sparrows Pt. *B3* | 16.50 | 1.25 | 19.50 | 5.25 | 22.00 | 8.75 | 24.50 | 9.50 | 25.00 | 10.50 | 25.50 | 11.00 | 27.00 | 10.75 | | | | | | | | |
| Youngstown *R3* | 18.50 | 1.25 | 21.50 | 5.25 | 24.00 | 8.75 | 26.50 | 10.00 | 27.00 | 11.00 | 27.50 | 11.50 | 29.00 | 11.75 | | | | | | | | |
| Fontana *K1* | 6.00 | 13.25 | 9.00 | +9.25 | 11.50 | +5.75 | 14.00 | +4.00 | 14.50 | +3.00 | 15.00 | +2.50 | 16.50 | +1.75 | | | | | | | | |
| Pittsburgh *J3* | 18.50 | 1.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 6.50 | +8.50 | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| Alton, Ill. *L1* | 16.50 | 1.25 | 19.50 | 5.25 | 22.00 | 8.75 | 24.50 | 9.50 | 25.00 | 10.50 | 25.50 | 11.00 | 27.00 | 10.75 | | | | | | | | |
| Sharon *M3* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | | | | | | | | |
| Fairless *N2* | 16.50 | 1.25 | 19.50 | 5.25 | 22.00 | 8.75 | 24.50 | 9.50 | 25.00 | 10.50 | 25.50 | 11.00 | 27.00 | 10.75 | | | | | | | | |
| Pittsburgh *N1* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 6.50 | +8.50 | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| Wheeling *W5* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | | | | | | | | |
| Wheatland *W4* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | | | | | | | | |
| Youngstown *Y1* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 6.50 | +8.50 | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| Indiana Harbor *Y1* | 17.50 | 2.25 | 20.50 | 6.25 | 23.00 | 9.75 | 25.50 | 10.00 | 26.00 | 11.50 | 26.50 | 12.00 | 28.00 | 11.75 | | | | | | | | |
| Lorain *N2* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 4.00 | +11. | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| EXTRA STRONG PLAIN ENDS | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 21.00 | 7.25 | 25.00 | 11.25 | 27.00 | 14.75 | 27.50 | 13.50 | 28.00 | 14.50 | 28.50 | 15.00 | 29.00 | 13.75 | | | | | | | | |
| Youngstown *R3* | 23.00 | 7.25 | 27.00 | 11.25 | 29.00 | 14.75 | 29.50 | 14.00 | 30.00 | 15.00 | 30.50 | 15.50 | 31.00 | 14.75 | | | | | | | | |
| Fairless *N2* | 21.00 | 7.25 | 25.00 | 11.25 | 27.00 | 14.75 | 27.50 | 13.50 | 28.00 | 14.50 | 28.50 | 15.00 | 29.00 | 13.75 | | | | | | | | |
| Fontana *K1* | 10.50 | | 14.50 | | 16.50 | | 17.00 | | 17.50 | | 18.00 | | 18.50 | | | | | | | | | |
| Pittsburgh *J3* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 8.00 | +6.00 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |
| Alton, Ill. *L1* | 21.00 | 7.25 | 25.00 | 11.25 | 27.00 | 14.75 | 27.50 | 13.50 | 28.00 | 14.50 | 28.50 | 15.00 | 29.00 | 13.75 | | | | | | | | |
| Sharon *M3* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | | | | | | | | |
| Pittsburgh *N1* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 8.00 | +6.00 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |
| Wheeling *W5* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | | | | | | | | |
| Wheatland *W4* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | | | | | | | | |
| Youngstown *Y1* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 8.00 | +6.00 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |
| Indiana Harbor *Y1* | 22.00 | 8.25 | 26.00 | 12.25 | 28.00 | 15.75 | 28.50 | 14.50 | 29.00 | 15.50 | 29.50 | 16.00 | 30.00 | 14.75 | | | | | | | | |
| Lorain *N2* | 21.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 5.50 | +8.50 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |

**Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.**

**Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.**

## TOOL STEEL

*F.o.b. mill*

| W | Cr | V | Mo | Co | per lb | SAE |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.60 | T-1 |
| 18 | 4 | 1 | — | 5 | 2.305 | T-4 |
| 18 | 4 | 2 | — | — | 1.765 | T-2 |
| 1.5 | 4 | 1.5 | 8 | — | .96 | M-1 |
| 6 | 4 | 2 | 6 | — | 1.35 | M-3 |
| 6 | 4 | 2 | 5 | — | 1.105 | M-2 |
| High-carbon chromium.. | | | | | .77 | D-3, D-5 |
| Oil hardened manganese | | | | | .43 | O-2 |
| Special carbon ..... | | | | | .39 | W-1 |
| Extra carbon ..... | | | | | .33 | W-1 |
| Regular carbon ..... | | | | | .275 | W-1 |

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb f.o.b.

| | Cladding | Plate (*A3, J2, L6*) 10 pct | 15 pct | 20 pct | Sheet (*I2*) 20 pct |
|---|---|---|---|---|---|
| Stainless Type | 304 | 30.30 | 33.15 | 36.05 | 32.50 |
| | 316 | 35.50 | 38.45 | 41.40 | 47.00 |
| | 321 | 32.60 | 34.85 | 37.75 | 37.25 |
| | 347 | 34.40 | 37.90 | 41.40 | 48.25 |
| | 405 | 25.80 | 29.60 | 33.35 | |
| | 410, 430 | 25.30 | 29.10 | 32.85 | |

CR Strip (S9) Copper, 10 pct, 2 sides, 33.00; 1 side, 30.00.

## ELECTRICAL SHEETS

| 22-Gage F.o.b. Mill Cents Per Lb | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) Semi-Processed | Fully Processed |
|---|---|---|---|
| Field | 8.40 | 8.60 | ..... |
| Armature | 9.35 | 9.60 | 10.10 |
| Elect. | 9.95 | 10.20 | 10.70 |
| Motor | 10.95 | 11.20 | 11.70 |
| Dynamo | 11.85 | 12.10 | 12.60 |
| Trans. 72 | 12.80 | 13.05 | 13.55 |
| Trans. 65 | 13.35 | Grain Oriented | |
| Trans. 58 | 13.85 | Trans. 80 | 17.45 |
| Trans. 52 | 14.85 | Trans. 73 | 17.95 |

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).
* Coils 75¢ higher.

## LAKE SUPERIOR ORES

51.50% *Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.*

| | Gross Ton |
|---|---|
| Openhearth lump | $12.10 |
| Old range, bessemer | 11.25 |
| Old range, nonbessemer | 11.10 |
| Mesabi, bessemer | 11.00 |
| Mesabi, nonbessemer | 10.85 |
| High phosphorus | 10.85 |

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails Col | Woven Wire Fence 9–15½ ga. Col | "T" Fence Posts Col | Single Loop Bale Ties Col | Galv. Barbed and Twisted Barbless Wire Col | Merch. Wire Ann'ld ¢/lb. | Merch. Wire Galv. ¢/lb. |
|---|---|---|---|---|---|---|---|
| Alabama City *R3* | 152 | 162 | .. | 173 | 175 | 7.40 | 7.80 |
| Aliquippa, Pa. *J3* | 152 | 162 | .. | ... | ... | 7.40 | 7.80 |
| Atlanta *A8* | 154 | 167 | .. | 177 | 180 | 7.60 | 8.125 |
| Bartonville *K2** | 154 | 168 | .. | 175 | 181 | 7.60 | 8.20 |
| Buffalo *W6* | ... | ... | .. | ... | ... | 7.50 | 7.90 |
| Chicago, Ill. *N4*** | 152 | 166 | .. | 175 | 179 | 7.50 | 8.10 |
| Cleveland *A6* | 157 | ... | .. | ... | ... | 7.50 | ..... |
| Cleveland *A5* | ... | ... | .. | ... | ... | 7.40 | ..... |
| Crawfordsville *M4** | 154 | 168 | .. | 177 | 181 | 7.60 | 8.20 |
| Donora, Pa. *A5* | 152 | 162 | .. | 175 | 175 | 7.50 | 7.90 |
| Duluth *A5* | 152 | 162 | .. | 175 | 175 | 7.50 | 7.90 |
| Fairfield, Ala. *T2* | 152 | 162 | .. | 175 | 175 | 7.50 | 7.90 |
| Galveston *D4* | 157 | ... | .. | ... | ... | ... | ..... |
| Houston *S2* | 157 | 170 | .. | ... | 180 | 7.65 | 8.05 |
| Johnstown, Pa. *B3** | 152 | 166 | .. | ... | 175 | 7.40 | 7.80 |
| Joliet, Ill. *A5* | 152 | 162 | .. | 175 | 175 | 7.50 | 8.10 |
| Kokomo, Ind. *C9* | 154 | 154 | .. | 177 | 177 | 7.60 | 8.00 |
| Los Angeles *B2** | ... | ... | .. | ... | ... | 8.35 | 8.925 |
| Kansas City *S2* | 157 | 167 | .. | 178 | 180 | 7.65 | 8.05 |
| Minnequa *C6* | 157 | 167 | 162 | 178 | 180 | 7.65 | 8.05 |
| Monessen *P6* | 152 | 162 | .. | ... | ... | 7.40 | 7.80 |
| Moline, Ill. *R3* | ... | 162 | 162 | ... | ... | ... | ..... |
| Pittsburg, Cal. *C7* | 171 | 185 | .. | 199 | 195 | 8.45 | 8.85 |
| Portsmouth *P7* | ... | ... | .. | ... | ... | 7.50 | ..... |
| Rankin, Pa. *A5* | 152 | 162 | .. | ... | 175 | 7.40 | 7.80 |
| So. Chicago *R3* | 152 | 162 | 157 | 173 | 175 | 7.40 | 7.80 |
| S. San Francisco *C6* | ... | ... | .. | 197 | 195 | 8.35 | 8.75 |
| Sparrows Pt. *B3** | 154 | ... | .. | 175 | 181 | 7.60 | 8.20 |
| Struthers, O. *Y1* | ... | ... | .. | ... | ... | 7.50 | 8.00 |
| Worcester *A5* | 158 | ... | .. | ... | ... | 7.70 | 8.20 |
| Williamsport, Pa. *S5* | ... | ... | 160 | ... | ... | ... | ..... |

Galvanized products computed with zinc at 5¢ per lb. Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

## WAREHOUSES

Metropolitan Price, dollars per 100 lb.

| Cities | ↔ City Delivery Charge | Sheets: Hot-Rolled | Cold-Rolled | Galvanized (10 gage) | Strip: Hot-Rolled | Cold-Rolled | Plates | Shapes: Standard Structural | Bars: Hot-Rolled | Cold-Finished | Alloy Bars: Hot-Rolled 4615 As rolled | Hot-Rolled 4140 Annealed | Cold-Drawn 4615 As rolled | Cold-Drawn 4140 Annealed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baltimore | $.10 | 7.31 | 8.32 | 8.37 | 7.65 | ..... | 7.63 | 7.93 | 7.61 | 8.62 | 14.38 | 13.44–13.96 | 16.56 | 16.28–16.49 |
| Birmingham | .15 | 6.80 | 7.93 | 8.85 | 7.06 | ..... | 6.99 | 7.28 | 7.08 | 9.35 | ..... | ..... | ..... | ..... |
| Boston | .10 | 8.22 | 9.17 | 10.42 | 8.31 | ..... | 8.51 | 8.37 | 8.37 | 9.83 | ..... | 13.66 | ..... | 16.76 |
| Buffalo | .15 | 7.35 | 8.40 | 10.16 | 7.50 | ..... | 7.80 | 7.75 | 7.50 | 8.05 | ..... | 13.45 | ..... | 16.50 |
| Chicago | .15 | 7.28 | 8.39 | 9.25 | 7.36 | ..... | 7.60 | 7.58 | 7.42 | 7.90 | ..... | 13.29 | ..... | 16.30 |
| Cincinnati | .15 | 7.40 | 8.38 | 9.10 | 7.60 | ..... | 7.89 | 8.05 | 7.66 | 8.30 | 13.59 | 13.29 | 16.44 | 16.39 |
| Cleveland | .15 | 7.28 | 8.39 | 9.10 | 7.46 | ..... | 7.77 | 7.91 | 7.48 | 8.15 | 13.41 | 13.11 | 16.26 | 16.21 |
| Denver | | 8.60 | 10.76 | 11.22 | 8.90 | ..... | 8.60 | 8.75 | 8.90 | 9.82 | ..... | ..... | ..... | 17.97 |
| Detroit | .15 | 7.47 | 8.58 | 9.53 | 7.49 | ..... | 7.88 | 8.05 | 7.70 | 8.19 | 13.70 | 13.40 | 16.55 | 16.50 |
| Houston | | 7.85 | 8.75 | 10.49 | 8.15 | ..... | 7.80 | 8.20 | 8.25 | 9.85–9.95 | 14.35 | 14.00 | 17.15 | 17.05 |
| Kansas City | .20 | 7.47 | 8.76 | 9.17 | 7.73 | ..... | 7.66 | 7.95 | 7.75 | 8.52 | 13.87 | 13.52 | 16.72 | 16.57 |
| Los Angeles | .10 | 8.25 | 10.10 | 11.10 | 8.60 | ..... | 8.85 | 8.40 | 8.25 | 11.00 | ..... | 14.45 | ..... | 18.00 |
| Memphis | .10 | 7.12 | 8.25 | ..... | 7.38 | ..... | 7.31 | 7.60 | 7.40 | 9.15 | ..... | ..... | ..... | ..... |
| Milwaukee | .15 | 7.37 | 8.48 | 9.34 | 7.45 | ..... | 7.69 | 7.75 | 7.51 | 8.09 | ..... | 13.29 | ..... | 16.39 |
| New Orleans | .15 | 7.20 | 8.35 | ..... | 7.45 | ..... | 7.40 | 7.70 | 7.50 | 9.55 | ..... | ..... | ..... | ..... |
| New York | .10 | 7.88 | 8.98 | 9.73 | 8.33 | ..... | 8.31 | 8.21 | 8.26 | 9.87 | ..... | 13.57 | ..... | 16.67 |
| Norfolk | .20 | 7.25 | ..... | ..... | 7.65 | ..... | 7.45 | 7.95 | 7.65 | 9.50 | ..... | ..... | ..... | ..... |
| Philadelphia | .10 | 7.44 | 8.54 | 9.51 | 8.09 | ..... | 7.82 | 7.85 | 7.83 | 8.62 | ..... | 13.35 | ..... | 16.45 |
| Pittsburgh | .15 | 7.28 | 8.39 | 9.55 | 7.46 | 9.00 | 7.60 | 7.58 | 7.42 | 8.00 | 13.35 | 13.05 | 16.20 | 16.15 |
| Portland | | 7.80–8.60 | 8.80–10.15 | 10.65 | 8.00 | 7.95 | 7.75 | 7.85–8.15 | 7.95 | 12.20 | ..... | 15.00 | ..... | 17.50 |
| Salt Lake City | .20 | ..... | 10.60 | ..... | 9.35 | ..... | ..... | 9.20 | 9.15 | ..... | ..... | ..... | ..... | ..... |
| San Francisco | .10 | 8.30 | 9.75 | 10.25 | 8.45 | ..... | 8.40 | 8.35 | 8.25 | 11.55 | ..... | 14.45 | ..... | 18.00 |
| Seattle | .00 | 8.75 | 10.50 | 10.90 | 8.90 | ..... | 8.50 | 8.50 | 8.60 | 12.25 | ..... | 14.65 | ..... | ..... |
| St. Louis | .15 | 7.57 | 8.68 | 9.54 | 7.65 | ..... | 7.89 | 7.98 | 7.71 | 8.44 | ..... | 13.49 | ..... | 16.59 |
| St. Paul | .25 | 7.94 | 8.59–9.14 | 9.89 | 7.72 | ..... | 7.65 | 7.94 | 7.74 | 8.51 | ..... | 13.51 | ..... | 16.31 |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

*Plus analysis charge. ‡Deduct for country delivery.

## C-R SPRING STEEL

| Cents Per Lb F.o.b. Mill | CARBON CONTENT 0.26–0.40 | 0.41–0.60 | 0.61–0.80 | 0.81–1.05 | 1.06–1.35 |
|---|---|---|---|---|---|
| Bristol, Conn. *W12* | ..... | ..... | 10.90 | 13.05 | 15.75 |
| Buffalo, N. Y. *R7* | 7.00 | 8.95 | 10.50 | 12.65 | 15.35 |
| Carnegie, Pa. *S9* | ..... | 9.05 | 10.60 | 12.75 | 15.35 |
| Cleveland *A5* | 7.10 | 9.05 | 10.60 | 12.75 | 15.45 |
| Detroit *D1* | 7.20 | 9.15 | 10.70 | 12.85 | ..... |
| Detroit *D2* | 7.20 | 9.15 | 10.70 | ..... | ..... |
| Harrison, N. J. *C11* | ..... | ..... | 10.90 | 13.05 | 15.75 |
| Indianapolis *C5* | 7.15 | 9.10 | 10.50 | 12.65 | 15.35 |
| New Castle, Pa. *B4* | 7.00 | 8.95 | 10.50 | 12.65 | ..... |
| New Haven, Conn. *D1* | 7.55 | 9.35 | 10.90 | 13.05 | ..... |
| Pawtucket, R. I. *N7* | 7.65 | 9.35 | 10.90 | 13.05 | 15.75 |
| Pittsburgh *S7* | 7.10 | 9.05 | 10.60 | 12.75 | 15.45 |
| Riverdale, Ill. *A1* | 7.20 | 9.05 | 10.60 | 12.75 | 15.45 |
| Sharon, Pa. *S1* | 7.10 | 9.05 | 10.60 | 12.75 | 15.45 |
| Trenton *R4* | ..... | ..... | ..... | ..... | ..... |
| Wallingford *W1* | 7.55 | 9.35 | 10.90 | 13.05 | 15.75 |
| Warren, Ohio *T4* | 7.00 | 8.95 | 10.50 | 12.65 | 15.35 |
| Weirton, W. Va. *W3* | 7.10 | 8.95 | 10.50 | ..... | ..... |
| Worcester, Mass. *A5* | 7.65 | 9.35 | 10.90 | 13.05 | 15.75 |
| Youngstown *C5* | 7.00 | 8.95 | 10.50 | 12.65 | 15.35 |

## BOILER TUBES

| $ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill | Size OD-In. | B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. | Elec. Weld C.D. |
|---|---|---|---|---|---|---|
| Babcock & Wilcox | 2 | 13 | 30.87 | 36.51 | 29.93 | ..... |
| | 2½ | 12 | 41.57 | 49.16 | 40.31 | ..... |
| | 3 | 12 | 47.99 | 56.76 | 46.55 | ..... |
| | 3½ | 11 | 56.03 | 66.27 | 54.34 | ..... |
| | 4 | 10 | 74.41 | 88.00 | 72.17 | ..... |
| National Tube | 2 | 13 | 32.09 | 37.37 | 29.93 | ..... |
| | 2½ | 12 | 43.22 | 50.31 | 40.31 | ..... |
| | 3 | 12 | 49.90 | 58.10 | 46.55 | ..... |
| | 3½ | 11 | 58.26 | 67.83 | 54.34 | ..... |
| | 4 | 10 | 77.36 | 90.07 | 72.17 | ..... |
| Pittsburgh Steel | 2 | 13 | 30.87 | 36.51 | ..... | ..... |
| | 2½ | 12 | 41.57 | 49.16 | ..... | ..... |
| | 3 | 12 | 47.99 | 56.76 | ..... | ..... |
| | 3½ | 11 | 56.03 | 66.27 | ..... | ..... |
| | 4 | 10 | 74.41 | 88.00 | ..... | ..... |

*(Effective May 1, 1956)*

## RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Screw Spikes | Tie Plates | Track Bolts Untreated |
|---|---|---|---|---|---|---|---|
| Bessemer *U1* | 4.725 | 5.65 | 5.825 | | | | |
| So. Chicago *R3* | | | | 8.05 | | | |
| Ensley *T2* | 4.725 | 5.65 | | | | | |
| Fairfield *T2* | | 5.65 | | 8.05 | | 5.625 | |
| Gary *U1* | 4.725 | 5.65 | | | | 5.625 | |
| Ind. Harbor *I3* | 4.725 | | 5.825 | 7.90 | | 5.625 | |
| Ind. Harbor *Y1* | | | | 8.05 | | | |
| Johnstown *B3* | | 5.65 | | | | | |
| Joliet *U1* | | | 5.825 | | | | |
| Kansas City *S2* | | | | 7.90 | | | |
| Lackawanna *B3* | 4.725 | 5.65 | 5.825 | | | 5.625 | |
| Lebanon *B3* | | | | | | | 12.15 |
| Minnequa *C6* | 4.725 | 6.15 | 5.825 | 7.90 | | 5.625 | 12.15 |
| Pittsburgh *O1* | | | | | 11.90 | | 12.15 |
| Pittsburgh *P5* | | | | | | | 12.15 |
| Pittsburgh *J3* | | | | 8.05 | | | |
| Seattle *B2* | | | | 8.40 | | 5.775 | 12.65 |
| Steelton *B3* | 4.725 | | 5.825 | | | 5.625 | |
| Struthers *Y1* | | | | 8.05 | | | |
| Torrance *C7* | | | | | | 5.775 | |
| Williamsport *S5* | | 5.65 | | | | | |
| Youngstown *R3* | | | | 8.05 | | | |

## COKE

| | |
|---|---|
| Furnace, beehive (f.o.b. oven) Connellsville, Pa. | Net-Ton $14.50 |
| Foundry, beehive (f.o.b. oven) Connellsville, Pa. | $17.00 to $18.00 |
| Foundry, oven coke | |
| Buffalo, del'd | $28.75 |
| Chicago, f.o.b. | 27.00 |
| Detroit, f.o.b. | 27.50 |
| New England, del'd | 28.55 |
| Seaboard, N. J., f.o.b. | 26.75 |
| Philadelphia, f.o.b. | 26.50 |
| Swedeland, Pa., f.o.b. | 26.50 |
| Painesville, Ohio, f.o.b. | 27.50 |
| Erie, Pa., f.o.b. | 27.50 |
| Cleveland, del'd | 29.43 |
| Cincinnati, del'd | 28.59 |
| St. Paul, f.o.b. | 26.50 |
| St. Louis, f.o.b. | 28.50 |
| Birmingham, f.o.b. | 25.65 |
| Lone Star, Tex., f.o.b. | 19.50 |

## ELECTRODES

*Cents per lb f.o.b. plant, threaded, with nipples, unboxed.*

| GRAPHITE Diam. (In.) | Length (In.) | Price | CARBON* Diam. (In.) | Length (In.) | Price |
|---|---|---|---|---|---|
| 24 | 84 | 23.00 | 40 | 100,110 | 9.90 |
| 20 | 72 | 22.25 | 35 | 110 | 9.90 |
| 18 to 18 | 72 | 22.50 | 30 | 110 | 10.05 |
| 14 | 72 | 23.00 | 24 | 72 to 84 | 10.30 |
| 12 | 72 | 23.50 | 20 | 90 | 10.10 |
| 10 | 60 | 24.25 | 17 | 72 | 10.35 |
| 7 | 60 | 24.50 | 14 | 72 | 10.85 |
| 5 | 60 | 27.25 | 12 | 60 | 11.75 |
| 4 | 40 | 30.25 | 10 | 60 | 11.80 |
| 3 | 40 | 32.00 | 8 | 60 | 12.10 |
| 2½ | 30 | 33.75 | | | |
| 2 | 24 | 52.50 | | | |

* Prices shown cover carbon nipples.

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, frt allowed in quantity)*

| | |
|---|---|
| Copper | |
| Cast elliptical, 18 in. or longer, 5000 lb lots | 61.92 |
| Electrodeposited | 57.75 |
| Brass, 80-20, ball anodes, 2000 lb or more | 60.00 |
| Zinc, ball anodes, 2000 lb lots | 21.75 |
| (for elliptical add 2¢ per lb) | |
| Nickel, 99 pct plus, rolled carbon | 90.05 |
| (rolled depolarized add 3¢ per lb) | |
| Cadmium | $1.70 |
| Tin, ball anodes and elliptical | $1.06 to $1.10 |

### Chemicals

*(Cents per lb, f.o.b. shipping point)*

| | |
|---|---|
| Copper cyanide, 100 lb drum | 83.50 |
| Copper sulphate, 5 or more 100 lb bags, per cwt | 18.15 |
| Nickel salts, single, 4-100 lb bags | 33.25 |
| Nickel chloride, freight allowed, 300 lbs | 43.50 |
| Sodium cyanide, domestic, fob N. Y. 1 to 4 200 lb drums | 22.35 |
| (Philadelphia price 22.60) | |
| Zinc cyanide, 100 to 900 lb | 55.55 |
| Potassium cyanide, 100 lb drum N. Y. | 48.00 |
| Chromic acid, flake type, 1 to 20 100 lb drums | 30.25 |

## BOLTS, NUTS, RIVETS, SCREWS

*(Base discount, f.o.b. mill)*

### Machine and Carriage Bolt

| | Discounts Full case Quantity | Full case 20,000 lb. or more |
|---|---|---|
| ½ in. & smaller x 6 in. & shorter | 61 | 63 |
| Larger than ½ in. diam. and all diam. longer than 6 in. | 55 | 57 |
| Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter | 61 | 63 |
| Lag, all diam. x 6 in. & shorter | 61 | 63 |
| Lag, all diam. longer than 6 in. | 55 | 57 |
| Plow bolts | 61 | 63 |

### Nuts, Hex, HP, reg. & hvy.

| | | |
|---|---|---|
| ⅜" or smaller | 64 | 66 |
| ⅞" to 1⅛" inclusive | 63 | 65 |
| 1¼" to 1½" inclusive | 65 | 67 |
| 1⅝" and larger | 61 | 63 |

### C.P. Hex regular & hvy.

| | | |
|---|---|---|
| ⅜" or smaller | 64 | 66 |
| ⅞" and larger | 61 | 63 |

### Hot Galv. Nuts (all types)

| | | |
|---|---|---|
| 1½" or smaller | 44 | 47 |

### Finished, Semi-finished, Hex Nuts

| | | |
|---|---|---|
| ¾" and smaller | 66 | 66 |
| ⅞" and larger | 63 | 63 |

Add 25% for less than case or keg quantity.

### Rivets

| | *Base per 100 lb* |
|---|---|
| ½ in. and larger | $9.95 |
| | *Pct Off List* |
| 7/16 in. and smaller | 33 |

### Cap Screws

| | *Discount* Bright | H.C. Heat |
|---|---|---|
| | *Treated* | |
| New std. hex head, packaged ¼" thru ½" diam. x 6" and shorter | 34 | 30 |
| 9/16" and ⅝" x 6" and smaller and shorter .. ¾", ⅞", 1" x 6" and shorter | 31 | 16 |
| | 9 | +11 |
| New std. hex head, bulk* ¼" thru ½" diam. x 6" and shorter | 49 | 41 |
| 9/16" and ⅝" diam. x 6" and shorter | 43 | 39 |
| ¾", ⅞", 1" x 6" and shorter | 31 | 20 |

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

### Machine Screws & Stove Bolts

| | Quantity | *Discount* Mach. Screws | Stove Bolts |
|---|---|---|---|
| Packaged, package list | | 27 | 38 |
| Bulk, bulk list | | | |
| ¼-in. diam. & under | 25,000-200,000 | 20 | 61 |
| 5/16-in. diam. & larger | 15,000-100,000 | 20 | 61 |
| All diam. over 3 in. long | 5,000-100,000 | — | 61 |

### Machine Screw & Stove Bolt Nuts

| | Quantity | *Discount* Hex | Square |
|---|---|---|---|
| Packaged, package list | | 24 | 27 |
| Bulk, bulk list | | | |
| ⅜-in. diam. & smaller | 25,000-200,000 | 18 | 20 |

## CAST IRON WATER PIPE INDEX

| | |
|---|---|
| Birmingham | 111.7 |
| New York | 123.7 |
| Chicago | 125.7 |
| San Francisco-L. A. | 134.8 |

*Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.*

## REFRACTORIES

| **Fire Clay Brick** | *Carloads per* 1000 |
|---|---|
| First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) | $122.00 |
| No. 1 Ohio | 114.00 |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 114.00 |
| No. 2 Ohio | 98.00 |
| Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) | 18.00 |

| **Silica Brick** | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. | $128.00 |
| Childs, Hays, Pa. | 138.00 |
| Chicago District | 138.00 |
| Western Utah | 144.00 |
| California | 151.00 |
| Super Duty | |
| Hays, Pa., Athens, Tex., Windham, Warren, O. | 145.00 |
| Curtner, Calif. | 163.00 |
| Silica cement, net ton, bulk, Eastern (except Hays, Pa.) | 21.00 |
| Silica cement, net ton, bulk, Hays, Pa. | 24.00 |
| Silica cement, net ton, bulk, Chicago District, Ensley, Ala. | 22.00 |
| Silica cement, net ton, bulk, Utah and Calif. | 32.00 |

| **Chrome Brick** | *Per net ton* |
|---|---|
| Standard chemically bonded, Balt. | $91.00 |
| Standards chemically bonded, Curtner, Calif. | 101.25 |
| Burned, Balt. | 85.00 |

| **Magnesite Brick** | |
|---|---|
| Standard Baltimore | $114.00 |
| Chemically bonded, Baltimore | 102.00 |

| **Grain Magnesite** | St. ¾-in. grains |
|---|---|
| Domestic, f.o.b. Baltimore in bulk fines removed | $64.00 |
| Domestic, f.o.b. Chewalah, Wash., Luning, Nev. | |
| in bulk | 40.00 |
| in sacks | 46.00 |

| **Dead Burned Dolomite** | *Per net ton* |
|---|---|
| F.o.b. bulk, producing points in: | |
| Pa., W. Va., Ohio | $15.00 |
| Midwest | 15.60 |
| Missouri Valley | 14.00 |

## METAL POWDERS

*Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.*

| | |
|---|---|
| Swedish sponge iron c.l.f. New York, ocean bags | 9.50¢ |
| Canadian sponge iron, Del'd in East, carloads | 9.5¢ |
| Domestic sponge iron, 98+% Fe, carload lots | 9.5¢ |
| Electrolytic iron, annealed, imported 99.5+% Fe | 27.5¢ |
| domestic 99.5+% Fe | 36.5¢ |
| Electrolytic iron, unannealed minus 325 mesh, 99+% Fe | 57.0¢ |
| Electrolytic iron melting stock, 99.84% pure | 22.0¢ |
| Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe | 86.0¢ to $1.55 |
| Aluminum freight allowed | 38.00¢ |
| Brass, 10 ton lots | 37.50¢ to 50.00¢ |
| Copper, electrolytic | 61.50¢ |
| Copper, reduced | 61.50¢ |
| Cadmium, 100-199 lb. 95¢ plus metal value | |
| Chromium, electrolytic 99.85% min. Fe .03 max. Del'd | $5.00 |
| Lead | 7.50¢ plus metal value |
| Manganese | 70.0¢ |
| Molybdenum, 99% | $3.00 to $3.25 |
| Nickel, unannealed | $1.00 |
| Nickel, annealed | $1.06 |
| Nickel, spherical, unannealed, ±80 | $1.18 |
| Silicon | 43.50¢ |
| Solder powder | 7.0¢ to 9.0¢ plus met. value |
| Stainless steel, 302 | 99.0¢ |
| Stainless steel, 316 | $1.32 |
| Tin | 14.00¢ plus metal value |
| Tungsten, 99% (65 mesh) | $4.50 |
| Zinc, 1# ton lots | 18.75¢ to 32.50¢ |

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- Speeds up processing cycle with existing exposure technics.
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- Reduces the possibility of pressure desensitization under shop conditions of use.

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**X-ray Division,**
**Rochester 4, N. Y.**

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# Ferroalloy Prices

*(Effective May 1, 1956)*

### Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

| | | | |
|---|---|---|---|
| 0.02% C | 38.50 | 0.20% C | 35.50 |
| 0.03% C | 38.00 | 0.50% C | 35.25 |
| 0.06% C | 36.50 | 1.00% C | 34.00 |
| 0.10% C | 36.00 | 1.50% C | 33.85 |
| 0.15% C | 35.75 | 2.00% C | 33.75 |

4.00-4.50 C, 67.70% Cr, 1-2% Si ... 26.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si ... 25.00
0.025% C (Simplex) ... 31.75

### High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

### Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

| | |
|---|---|
| 0.10% max. C | $1.27 |
| 0.50% max. C | 1.27 |
| 9 to 11% C, 88-91% Cr, 0.75% Fe.. | 1.36 |

### Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (¼" thick) delivered packed. 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

| | |
|---|---|
| Carloads | 1.25 |
| Ton lots | 1.27 |
| Less ton lots | 1.29 |

### Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

| | |
|---|---|
| Carloads | 41.85 |
| Ton lots | 46.15 |
| Less ton lots | 48.65 |

### Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.

| | |
|---|---|
| Carloads | 22.95 |
| Ton lots | 25.25 |
| Less ton lots | 26.75 |

### Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

| | |
|---|---|
| Carloads | 23.05 |
| Ton lots | 24.95 |
| Less ton lots | 25.95 |

### SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ⅛ in. x 12 mesh.

| | |
|---|---|
| Ton lots | 19.65 |
| Less ton lots | 20.90 |

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

| | |
|---|---|
| Carload lots | 17.20 |
| Ton lots | 18.70 |
| Less ton lots | 19.95 |

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

| | |
|---|---|
| Carload packed | 18.50 |
| Ton lots to carload packed | 19.65 |
| Less ton lots | 20.90 |

### Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

| Producing Point | Cents per-lb |
|---|---|
| Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. | 10.75 |
| Johnstown, Pa. | 10.75 |
| Sheridan, Pa. | 10.75 |
| Philo, Ohio | 10.75 |
| S. Duquesne | 10.75 |

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:

| | |
|---|---|
| Carloads, bulk | 13.00 |
| Ton lots packed | 15.20 |

### Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

| Manganese | Silicon | |
|---|---|---|
| 16 to 19% | 3% max. | $92.00 |
| 19 to 21% | 3% max. | 94.00 |
| 21 to 23% | 3% max. | 96.50 |

### Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

| | |
|---|---|
| Carload, packed | 45.75 |
| Ton lots | 47.25 |

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

| | |
|---|---|
| Carloads | 31.5 |
| Ton lots | 33.5 |
| 250 to 1999 lb | 35.5 |
| Premium for hydrogen-removed metal | 0.75 |

### Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn. .. 22.85

### Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.07% max. C, 0.06% P, 90% Mn | 34.00 | 36.55 | 37.75 |
| 0.07% max. C | 31.95 | 34.50 | 35.70 |
| 0.10% max. C | 31.20 | 33.75 | 34.95 |
| 0.15% max. C | 30.45 | 33.00 | 34.20 |
| 0.30% max. C | 28.95 | 31.50 | 32.70 |
| 0.50% max. C | 28.45 | 31.00 | 32.20 |
| 0.75% max. C, 80-85% Mn, 5.0-7.0% Si | 25.45 | 28.00 | 29.20 |

### Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

| | |
|---|---|
| Carload bulk | 12.00 |
| Ton lots | 13.45 |
| Briquet contract basis carloads, bulk, delivered, per lb of briquet | 13.55 |
| Ton lots, packed | 15.75 |

### Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

| | Ton lots | Carloads |
|---|---|---|
| 96.50% Si, 2% Fe | 22.75 | 21.45 |
| 98% Si, 1% Fe | 23.25 | 21.95 |

### Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

| | |
|---|---|
| Carloads, bulk | 7.15 |
| Ton lots, packed | 9.75 |

### Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

| | | | |
|---|---|---|---|
| 50% Si | 12.75 | 75% Si | 15.40 |
| 65% Si | 14.50 | 85% Si | 17.10 |
| | 90% Si | 18.50 | |

### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots | $2.05 | $2.95 | $3.75 |
| Less ton lots.. | 2.40 | 3.30 | 4.55 |

### Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

| | |
|---|---|
| Openhearth | 3.10 |
| Crucible | 3.20 |
| High speed steel (Primos) | 3.30 |

### Alsifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

| | |
|---|---|
| Carloads | 10.65¢ |
| Ton lots | 11.80¢ |

### Calcium molybdate, 43.6-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo ... $1.34

### Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

| | |
|---|---|
| Ton lots | $6.90 |
| Less ton lots | 6.95 |

### Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta ... $4.65

### Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo .. $1.54

### Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton ... $90.00
10 tons to less carload ... $110.00

### Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.35

### Ferrotitanium 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.50
Less ton lots ... $1.55

### Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... $177.00

### Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, delivered ... $3.45

### Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. ... $1.33
bags, f.o.b. Washington, Pa., Langeloth, Pa. ... $1.30

### Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

| | |
|---|---|
| Carload, bulk lump | 17.50¢ |
| Ton lots, packed lump | 19.50¢ |
| Less ton lots | 20.00¢ |

### Vanadium oxide, 86-89% $V_2O_5$

contract basis, per pound contained $V_2O_5$ ... $1.33

### Zirconium contract basis, per lb of alloy

| | |
|---|---|
| 35-40%, f.o.b. freight allowed, carloads, packed | 26.25¢ |
| 12-15%, del'd, lump, bulk-carloads | 8.50¢ |

### Boron Agents

**Borosil,** contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B 3.14%, Si 40-45%, per lb contained 2 ... $5.25

**Bortam,** f.o.b. Niagara Falls

| | |
|---|---|
| Ton lots, per pound | 45¢ |
| Less ton lots, per pound | 50¢ |

**Corbortam,** Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound ... 10.00¢

**Ferroboron,** 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots ... 1.20
F.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up

| | |
|---|---|
| 10 to 14% B | .85 |
| 14 to 19% B | 1.20 |
| 19% min. B | 1.50 |

**Grainal,** f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

| | |
|---|---|
| No. 1 | $1.05 |
| No. 79 | 50¢ |

**Manganese - Boron,** 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
D, del'd.

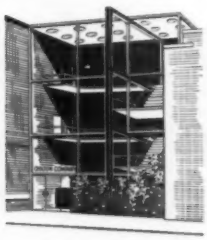
| | |
|---|---|
| Ton lots | $1.44 |
| Less ton lots | 1.57 |

**Nickel-Boron,** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... $2.05

# Talking Shop

Whatever our business, trade or profession, that, we may be certain, is what we'll talk more about than anything else. Talking shop is irresistible. It's a good thing, too. It's an indication of our interest in what concerns us most . . . of our desire to be well informed.

Were it not for business publications, each of us, talking shop, would be restricted to subjective chatter about what personal experience alone has taught us. Business publications are the silent and able moderators of shop talk. Current, thorough, authoritative, they point the way to objective conversation and provide the facts and ideas upon which much of it is based.



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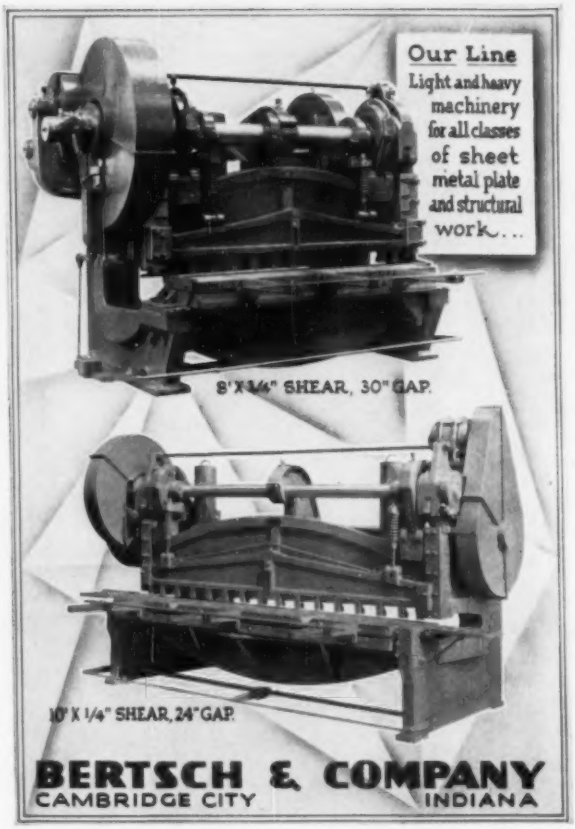
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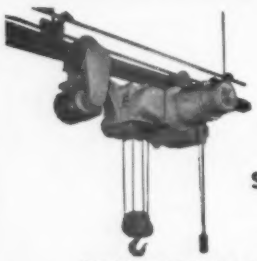

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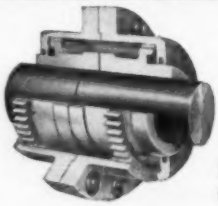

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## THE CLEARING HOUSE

### News of Used and Rebuilt Machinery

**New York Report . . .** Major complaint of used and rebuilt machine tool dealers in the New York area is lack of machine tools to sell. Business continues to hold up nicely. Relatively long delivery times for new machine tools adds steam to this market.

Demand for brakes and shears, always big items in this market, continues strong. Orders for small power presses dominate press business here, but business in heavy hydraulic presses, when available, is reported as definitely good.

An amusing situation is shaping up here in respect to what makes a machine tool "late." In recent years, a "late model" tool has meant machinery dating from 1940 on through the World War II period. While demand for tools of this vintage continues very good, the really hot demand is for what one dealer calls "late late" models—that is, tools dating from 1945 on. These models are very scarce, and are snapped up as fast as they appear on the market. On the other hand, boring mills of any type move fast, and even those dating from the 1930's are acceptable at least as "early late" models. This is particularly true of heavy duty models from, say, 52 in. on up.

**Hot Items . . .** Radial drill presses are a very hot item in this area, and can be sold almost sight unseen when they can be found. Well known brand names are a big factor on almost all tools, especially turret lathes and milling machines. Customers will pay heftily higher prices for the better known makes, although they will accept lesser known models when they have to. And, of course, the sought-after makes are very scarce — "virtually non-existent," one dealer puts it.

Demand from all segments of the market continues. Dealers say steel fabricators are pressing hard for machines for bending and similar machines in addition to the demand for regular machine tools. One dealer has sold two ironworkers in the past month, had neither in his shop more than two days.

At least one dealer is frankly worried about current high prices. He feels that good used machines are too expensive because of scarcity. In his experience, many customers take a look at used tool price tags, decide they can afford a new machine if they must pay so much for a used one. On the other hand, this same dealer has an 18-month backlog on new tool orders. If customers want a new tool right away, and most are more than impatient, they will have to settle for a used one, price or no. This, he feels, is the major prop to current high used machinery prices.

**Auction Effect . . .** Recent auctions have somewhat increased the supply of tools here, but no one would say the market is glutted. Any rise in availability has been matched by a boost in business volume as dealers filled orders stamped "rush" from anxious customers.

Overall, dealers in this area see their business holding up well. Most are doing at least as well as last year, and several better. Queries on a summer slack-off bring little response in this area. With new machinery on substantial delivery times and metalworking and construction booming, dealers here see little reason to anticipate a slump.

Reports from some other areas say that everything is up but profits. It's admittedly not getting any cheaper to do business anywhere, but if New York area dealers are feeling notably pinched, they are staying remarkably calm about it. Their biggest complaint is lack of tools to sell at present high prices. But this is no new problem to old hands in the trade.

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No. 35 U. S. Multi Slide Machine with Edgewise Stock Straightener

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125 ton Beatty Inclined Open Back Gap Press, Stroke 1½", Bed Area 28⅞" x 16⅞" (New)

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530 ton Baldwin Southwark 12" Stroke 48" x 25" Between Columns
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8 Stand Rafter Tube Forming Machine, Spindle 1⅞"

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Pels Type IS-23, Capacity 2" Rd., 1¾" Sq.

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No. 7 Hilles & Jones, Motor Drive, Cap. 5" Sq.

**SHEARS—GATE**
80" x ⅜" Pels
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6 x 6 x ¾" Cleveland

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12' x ⅜" Steelweld

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| Qu. | H.P. | Make | Type | Volts | Speed |
|---|---|---|---|---|---|
| 1 | 1500 | G.E. | MT | 5900 | 1187 |
| 1 | 1100 | G.E. | 1M | 2300 | 720 |
| 1 | 1000 | A.C. | Mill | 2300 | 340 |
| 1 | 800 | G.E. | MT | 2300 | 293 |
| 1 | 750 | G.E. | MT-573 | 2300 | 1190 |
| 1 | 700 | A.C. | | 2300 | 500 |
| 1 | 500 | Whse. | CW | 550 | 350 |
| 1 | 400 | Whse. | CW-960A | 440 | 1170 |
| 1 | 400 | Whse. | CW | 440 | 514 |
| 1 | 400 | Whse. | CW-1213 | 2200 | 435 |
| 1 | 350 | G.E. | IM-17A | 440/2300 | 720 |
| 1 | 250 | G.E. | MT-424Y | 4000 | 257 |
| 1 | 250 | G.E. | MT-559S | 2200 | 1800 |
| 1 | 250 | Al. Ch. | | 550 | 600 |
| 1 | 200 | Or. Wh. | 20QB | 440 | 505 |
| 1 | 200 | G.E. | IM | 440 | 435 |
| 1 | 200 | G.E. | IM | 2280 | 580 |
| 1 | 150 (unused) | Whse. | CW | 2300 | 435 |
| 2 | 125 | A.C. | | 440 | 865 |
| 1 | 125 | Al. Ch. | | 440 | 720 |
| 1 | 100 | G.E. | IM-16 | 2200 | 435 |
| 1 | 100 | G.E. | IM | 440 | 600 |
| 4 | 100 | A.C. | ANY | 440 | 695 |

**SQUIRREL CAGE**

| | | | | | |
|---|---|---|---|---|---|
| 1 | 800 | G.E. | KT-573 | 2200 | 1180 |
| 3 | 650 | G.E. | FT-559BY | 440 | 3570 |
| 2 | 450 | Whse. | CS-1429 | 2300/4150 | 354 |
| 1 | 400 | G.E. | IE-15B | 2200 | 1165 |
| 1 | 400 | G.E. | IK | 2200 | 500 |
| 1 | 200 | G.E. | IK-17 | 440 | 580 |
| 8 | 200 | G.E. | KT-557 | 440 | 1800 |
| 1 | 150/75 | G.E. | IK | 440 | 900/450 |
| 1 | 150 | Whse. | CS-856B | 440 | 880 |
| 1 | 150 | Whse. | CS | 440 | 580 |
| 2 | 125 | Al. Ch. | ARW | 2200 | 1750 |
| 1 | 100 | Whse. | CS-876C-TEFC | 440 | 710 |

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| | | | | | |
|---|---|---|---|---|---|
| 2 | 2000 | Whse. | | 2300 | 120 |
| 2 | 1750 | G.E. | ATI | 2200 | 3600 |
| 1 | 735 | G.E. | ATI | 2200/12000 | 600 |
| 1 | 500 | "dral | SM | 2300/4160 | 1800 |
| 2 | 500 | E. | TS-7567 | 2200 | 1200 |
| 1 | 450 | ..hse. | | 2200 | 128.5 |
| 1 | 450 | Whse. | | 2200 | 450 |
| 1 | 400 | G.E. | TS-7565 | 2200 | 1200 |
| 1 | 400 | G.E. | TS | 2200 | 400 |
| 1 | 4350 | C.W. | 2501SL | 4000/6900/13800 | 514 |
| 1 | 325 | G.E. | ATI | 440 | 1800 |
| 1 | 225 | G.E. | ATI | 440 | 1800 |

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| 2 | 1250 | Whse. | 720 | 600 | 2300 |
| 1 | 500 | Cr. Wh. | 720 | 600 | 2300/440 |
| 2 | 500 | Whse. | 1200 | 125/250 | 2300/440 |
| 1 | 400 | Cr. Wh. | 1200 | 125/250 | 2300/440 |
| 1 | 300 | G.E. | 1200 | 250 | 2300 |
| 1 | 200 | G.E. | 1200 | 250 | 2300 |
| 1 | 150 | G.E. | 1200 | 250 | 2300 |
| 1 | 100 | Whse. | 900 | 250 | 2300 |

**LARGE MILL MOTORS**

| Qu. | H.P. | Make | R.P.M. | Volts | Type |
|---|---|---|---|---|---|
| 2 | 3000 | Whse. | 600 | 525 | tandem |
| 6 | 1500 | Whse. | 600 | 525 | Encl. |
| 1 | 1250 | G.E. | 350/790 | 600 | MCF-6 |
| 4 | 800 | Whse. | 600 | 525 | Encl. |
| 4 | 700 | Whse. | 300/700 | 250 | Encl. |
| 2 | 600 | Al. Ch. | 300/600 | 600 | Mill |
| 1 | 250 | Al. Ch. | 250/1000 | 250/375 | Mill |

**SLIP RING MOTORS**
**Constant Duty, 3 Phase, 60 Cycle**

| Qu. | H.P. | Make | Type | Volts | R.P.M. |
|---|---|---|---|---|---|
| 1 | 1500 | G.E. | MT-498 | 2300 | 360 |
| 2 | 1000 | G.E. | M-575-S | 2300 | 1185 |
| 1 | 750 | G.E. | I-M | 2200 | 400 |
| 1 | 500 | Al. Ch. | ANY | 2200 | 505 |
| 1 | 500 | G.E. | I-M | 2200 | 450 |
| 1 | 450 | G.E. | I-14-M | 2300 | 505 |
| 1 | 450 | Whse. | CW | 2200 | 440 |
| 1 | 400 | Al. Ch. | ANY | 2200 | 585 |
| 1 | 400 | G.E. | MT-424 | 2300/440 | 352 |
| 1 | 300 | Whse. | CW-1012 | 2200 | 704 |
| 1 | 250 | Al. Ch. | ANY | 440 | 705 |
| 1 | 250 | Whse. | CW-1106 | 2200 | 435 |
| 1 | 250 | G.E. | MT-414 | 2200 | 300 |
| 2 | 200 | Al. Ch. | ANY | 2200 | 585 |
| 1 | 200 | G.E. | I-14-M | 2200 | 490 |
| 1 | 150 | Al. Ch. | ANY | 440/220 | 705 |
| 1 | 150 | Whse. | CW | 440/220 | 490 |
| 1 | 150 | Whse. | CW-1000 | 440/220 | 435 |
| 1 | 100 | Whse. | CW | 440/220 | 870 |
| 1 | 100 | El. Dy. | EDY-612 | 2300 | 900 |
| 1 | 100 | G.E. | MT-558 | 440/220 | 700 |
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1—Leveller & Cut-off Machine, Clevo, Punch & Shear; 5 sets of 4" x 48" rolls with pinch rolls on both sides; shear is down-cut—max. length of feed 120", min. length 6"; max. rate of feed 200 FPM, with coil. Cradle reel having cap. of 8,000#, 56" max. O.D.
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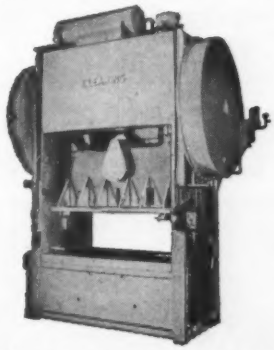

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## METALWORKING BRIEFS

### Steel Mill Sale Rumors Denied

Owners and alleged buyers are busy denying rumors that Newport Steel Co. is being sold. Rumors centered about three probable buyers, including a scrap dealer. Spokesmen for Olin Industries, one of the supposed buyers, denied any knowledge that a deal was in the making. And so did Merrit-Chapman-Scott, present owners of Newport. Acme Steel is another rumored buyer.

### Strike Hits Southern Steel Production

A walkout of railroaders shut down the Tennessee Coal and Iron Div. of U. S. Steel Corp. early this week. Some 25,000 steel workers refused to cross picket lines set up by the railroad men, who are asking a 37 cent per hr wage boost. Birmingham district ingot rate dropped from a scheduled 96.5 pct to 23.5 pct.

### Big Forge Press Starts Operating

Aluminum Co. of America's 8000-ton hydraulic forging press is going into production at Vernon, California. The press is capable of producing forgings 500 sq in. or more in area. It was built for Alcoa by Scholoemann, A. G. in Dusseldorf, Germany, and shipped overseas via the Panama Canal.

### Machine Tool Shipments Off In '55

National Machine Tool Builders' Assn. reports that metal-cutting machine tool shipments last year totaled approximately $670.4 million. This compares with $891.7 million in 1954 and $1.2 billion in 1953. Machine tool boom got off to a late start in '55, following the big show in September.

### Zirconium Supply Contract Announced

A $22,750,000 five-year zirconium supply contract between Atomic Energy Commission and NRC Metals Corp., subsidiary of National Research Corp., was announced. Contract calls for annual supply of 700,000 lb of hafnium-free reactor grade zirconium produced by a new process. A plant will be built near Pensacola, Fla.

### Steel Companies Make Defensive Move

Steel producers have begun notifying the United Steel Workers they will terminate their labor contracts on the expiration date, June 30. The move was regarded as a maneuver against the possibility of selective strikes by the union in event of a deadlock.

### New Heat Pump for Industry

A significant advance in industrial heat pump design was revealed by York Corp. The new pump provides satisfactory winter heating without use of booster heating strips. One unit is operating, another installed. Compound compression is used.

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**An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.**


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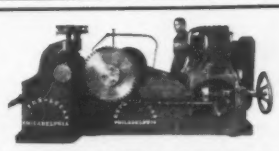

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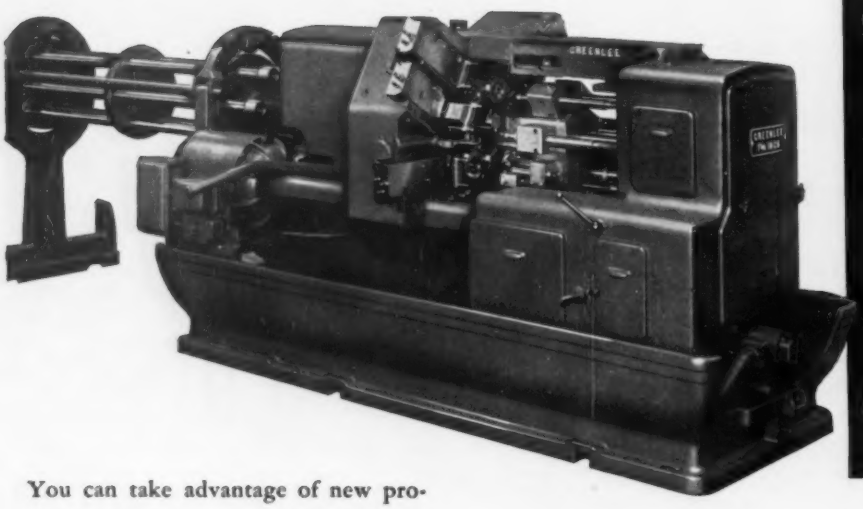

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# Customer's Report

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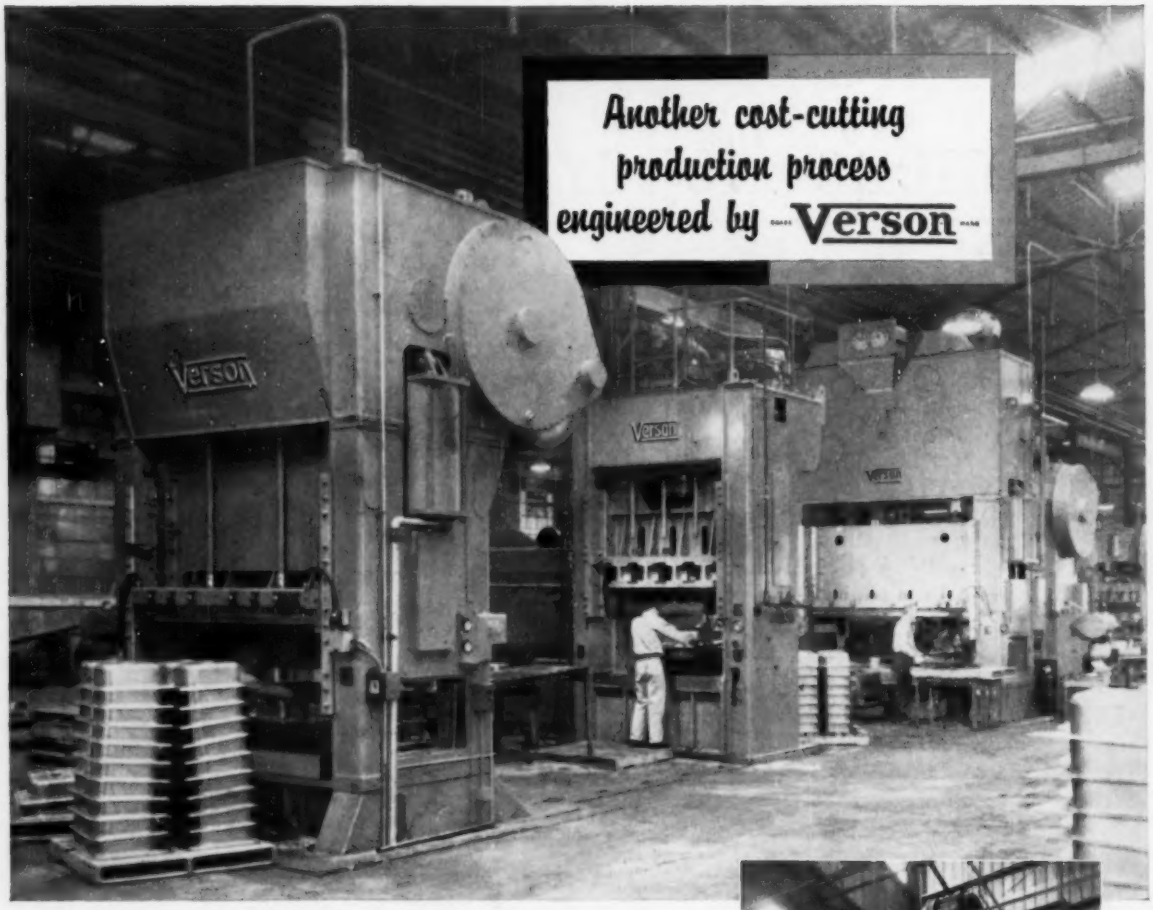
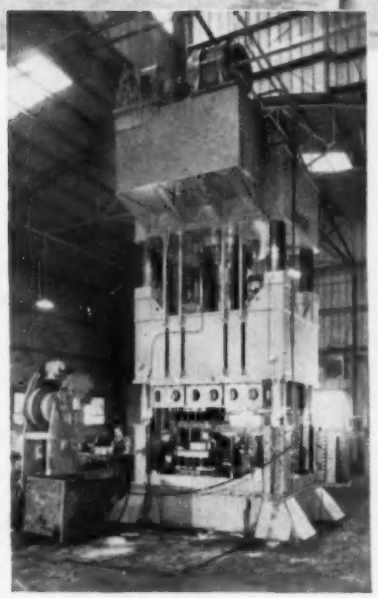



# This —Verson— line-up cuts costs on double sump sinks



●The press line illustrated above, part of the final operations in forming double sump sink units before porcelain enamelling, includes Verson eccentric, hydraulic and crank presses. Previous operations on the sinks include deep drawing the sumps to a depth of 7⅜" from 14 gauge Armco deep drawing stock on a 1000 ton Verson hydraulic press and piercing and embossing the center drain hole in the sinks on a Verson O.B.I. Both of these presses are shown at the right.

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